THE LIQUID DATA CENTER
Liquid cooling is coming sooner than expected to a data center near you, says Robert L. Mitchell. **PAGE 38**

GROUNDED
IT systems have been partially blamed for the cancellation of 1,000 JetBlue flights. **PAGE 44**

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FEBRUARY 26, 2007 ▪ VOL. 41 ▪ NO. 9 ▪ $5/COPY

HOME OFFICE LOCKDOWN

Virtual offices pose **huge data risks.** Here's how to minimize them. **Page 26**

Feds Probe Spending for Virtual Fence

Cost estimates for Boeing-led border security project now as high as $30B

BY MATT HAMBLEN

Leading House Democrats and government accountants are scrutinizing The Boeing Co.'s multibillion-dollar contract to design and build a U.S. border security system rich with advanced perimeter-protection technology. And they are raising serious concerns about the project's cost and management.

The U.S. Department of Homeland Security initially said the high-tech fence, called SBInet, could cost as little as $2 million, but the price could balloon to as much as $30 billion, according to one congressman. The fences along the Mexican and Canadian borders will include all-weather electro-optic gear, infrared cameras, radar and digital communications equipment.

The DHS, which will give estimates only for the Mexican border portion of SBInet, said the southern section will cost $7.6 billion through 2011, according to a report issued earlier this month by the U.S. Government Accountability Office.

Milestones have not been set for the Canadian border, although the DHS told the GAO that the upper limit of funding will provide border security technology for "6,000 miles of secure U.S. border," which includes both

Virtual Fence, page 16

INSIDE
Sen. Dianne Feinstein asks GAO to investigate e-voting machine woes. Page 44

GM Aims for Uniform Global IP Net

$1B pact lets AT&T oversee regional telecom providers

BY PATRICK THIBODEAU

General Motors Corp. last week handed AT&T Inc. a five-year, $1 billion contract to continue building a global IP network for voice, data and video traffic. In the new deal, AT&T also becomes the übermanager of GM's regional network providers.

Ralph Szygenda, GM's CIO and group vice president, said the IP network is intended to help GM operate as a "real-time global business" whose workers can collaborate using a consistent set of technologies, whether the workers are in Detroit, Shanghai or Zurich.

The contract renews a prior five-year agreement and expands on it by giving AT&T responsibility for managing GM's relationships with 150 other telecommunications providers around the globe.

AT&T's new management role is part of GM's year-old effort to ensure that all of its IT providers work together as a team and follow a consistent set of service and support practices.

"Information technology providers have to work as one in a corporation," Szygenda said. "They can't work as a bunch of IT companies competing against each other in-

Global IP Net, page 16

Military Intelligence Goes Web 2.0

DOD agency using wikis, AJAX, blogs

BY HEATHER HAVENSTEIN

The U.S. Department of Defense's lead intelligence agency is using wikis, blogs, RSS feeds and enterprise "mashups" to help its analysts collaborate better when sifting through data used to support military operations.

The Defense Intelligence Agency is seeing "mushrooming" use of various Web 2.0 technologies, which are becoming increasingly critical to accomplishing missions that require analysts to share intelligence, said Lewis Shepherd, chief of the DIA's requirements and research group at the Pentagon.

The tools are helping the

Web 2.0, page 44

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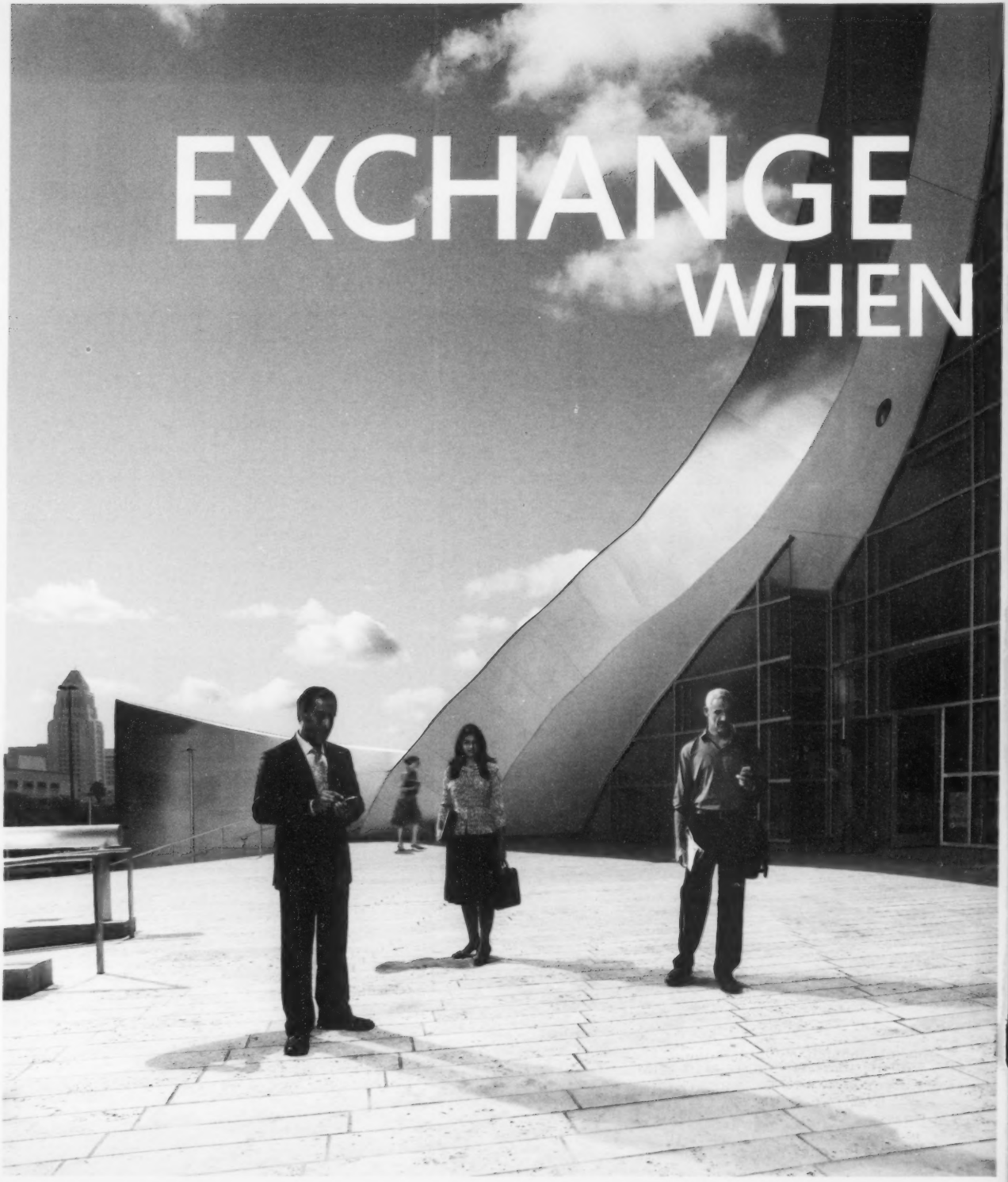
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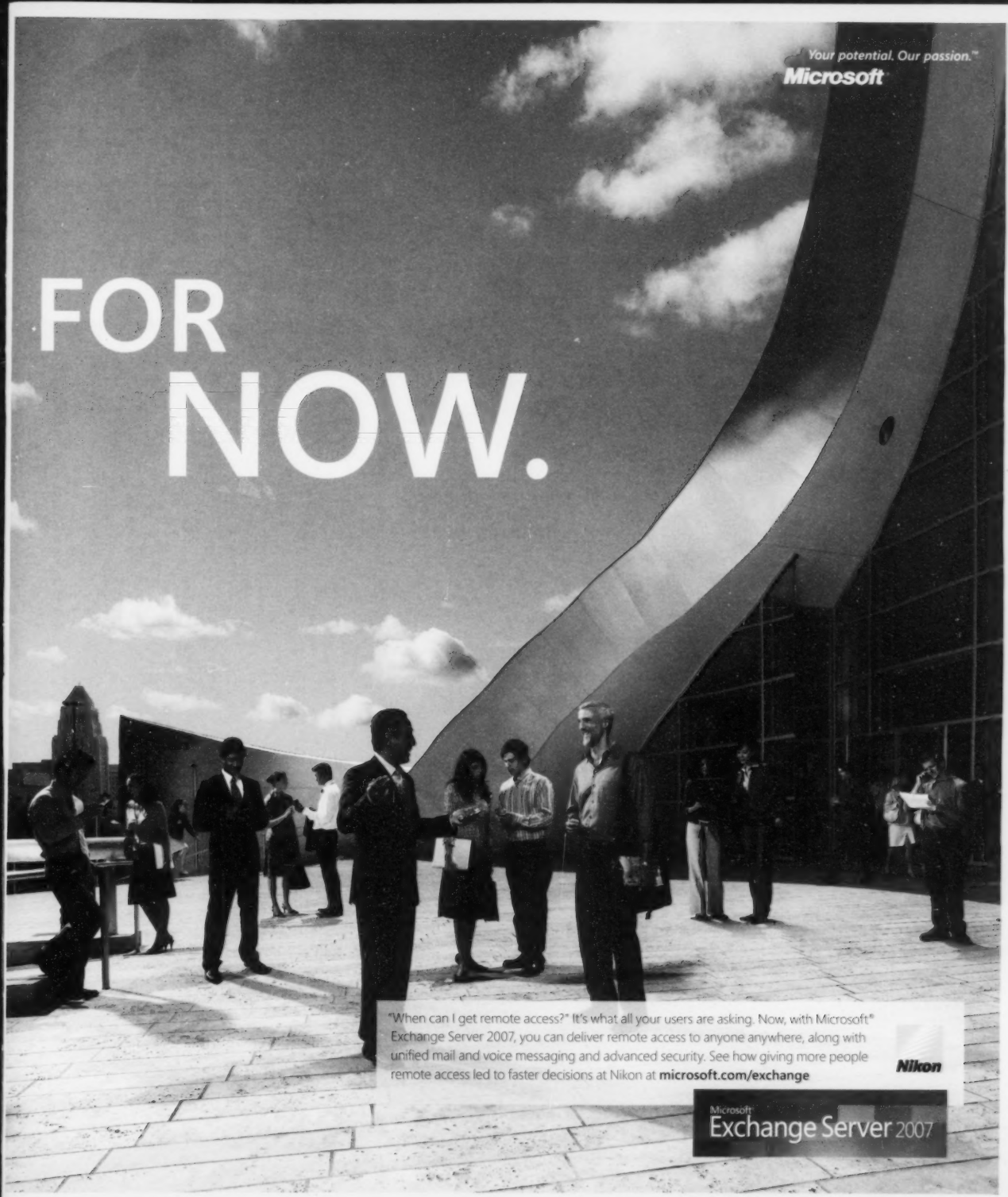
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8 JetBlue officials say overwhelmed IT systems were partly to blame for its cancellation of more than 1,000 flights after an ice storm last week.

11 Q&A: Richard Dracott, general manager of Intel's new high-performance computing unit, discusses HPC technology in general and Intel's specific plans for it.

11 Google's upgraded application suite has the potential to one day challenge Microsoft Office, some users and analysts say.

14 Wal-Mart acknowledges that RFID implementations in its distribution centers are behind schedule, but it says the overall effort is on track and reports that it has hastened efforts to add the technology to its stores.

20 Global Dispatches: Software piracy charges are dropped against a Russian school principal due to a lack of evidence; and a Kuwaiti telecommunications company will create a $10.5 billion fund to expand in Africa.

22 At the prompting of doctors, the University of California, San Francisco, Medical Center has launched an effort to test the viability of dual-mode telephones.

44 Sen. Dianne Feinstein asks the GAO to investigate troubled e-voting machines.

STRATEGIES & TACTICS

Lose Unwanted Gigabytes Overnight!

Data de-duplication technology eliminates redundant versions of files, yielding a dramatic reduction in backup storage needs. Analysts say that putting your information on this diet can shrink 20TB of data into 1TB.

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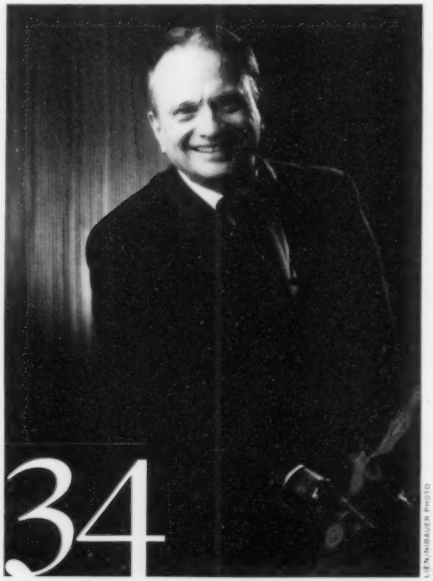

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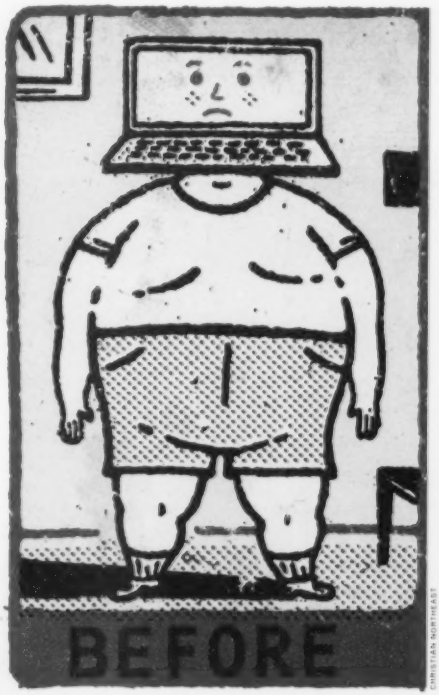

CHRISTIAN NORTHEAST

26 Home Office Lockdown. Virtual offices put corporate data at risk. There are tools to mitigate the threat, but most companies still lack policies. Here are some steps you can take to improve security today.

33 Q&A: How IT Makes Johnny More Productive. A ground-breaking study shows that IT enables multitasking and broad information networks, which lead to solid productivity gains at the individual level. Marshall Van Alstyne discusses his research.

34 IT Mentor: 25 Time-tested Truths About IT Support. Bob Anderson (left) presents a career's worth of axioms that can help you design support processes for better productivity, service and overall performance.

36 Security Manager's Journal: Getting the NAC of Things at RSA. When dealing with a problem like access control, Mathias Thurman finds that the RSA conference is a good place to look for answers.

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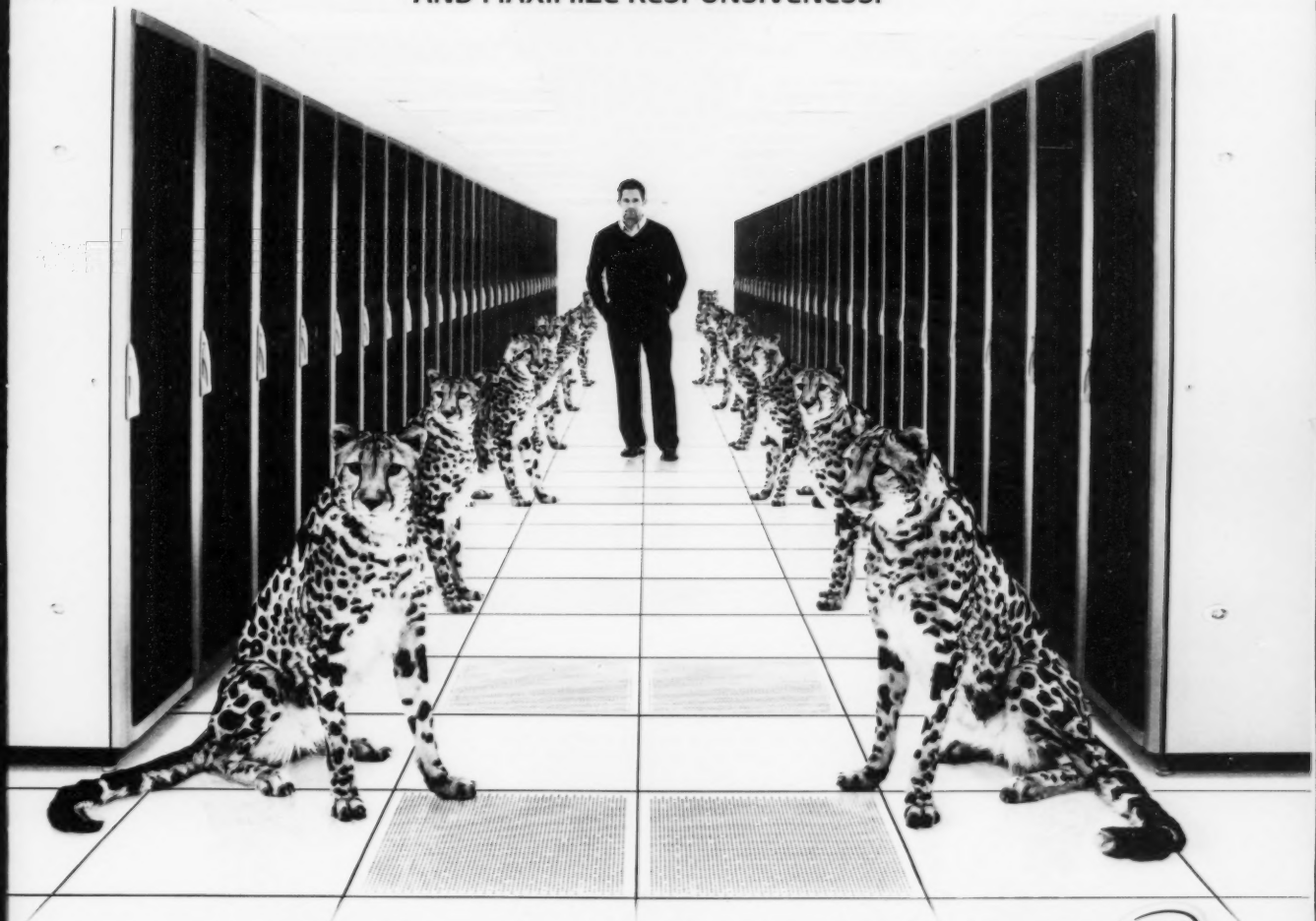

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24 **Virginia Robbins** offers advice about handling people she politely refers to as PITAs — those co-workers who make your 9-to-5 life more difficult.

25 **Ben Rothke** argues that the most serious threat to corporate networks is the one posed by insiders.

30 **Robert L. Mitchell** contends that liquid cooling is coming sooner than you might think. But standards may have to come later.

46 Frankly Speaking: **Frank Hayes** is excited by the data derived from two studies on disk drive failure. He says the information will be a boon to data center managers.

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COMPUTERWORLD.COM THIS WEEK

KNOWLEDGE CENTERS

Longhorn Server Revealed

SERVERS AND DATA CENTER: Columnist Jonathan Hassell discusses five IIS enhancements you should know about, including modularity and the ability to configure IIS 7 from a text file.
www.computerworld.com/servers

But It's Good for You . . .

SECURITY: Encryption is like flossing — everyone knows they should, but a lot of folks dread it or don't do it well. Anton Chuvakin points out five potential pitfalls in efforts to secure your data. www.computerworld.com/security

Build Your Own Yahoo Pipe

NETWORKING & INTERNET: Yahoo's new RSS mashup application is so easy, even an editor can do it. www.computerworld.com/networking

A Good Place to Start in IT

CAREERS: Robert Half Technology's Katherine Spencer Lee offers reasons why starting one's IT career on the help desk is a good idea.
www.computerworld.com/careers

SHARK BAIT BETA

Printing Issue

I get this e-mail from someone who can't print a Visio file. She says the file opens and freezes. . . . http://sharkbait.computerworld.com/?q=node/357

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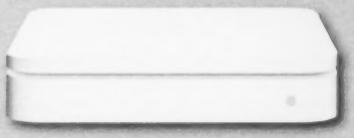
TOP-READ STORIES

First look: A Wireless Wow

MACINTOSH: With its new Airport Extreme base station, Apple moves ahead into the still uncharted world of 802.11n wireless networking.
www.computerworld.com/mobilewireless



Buying a New PC? 'Windows Vista Capable' Barely Hits the Mark

OPERATING SYSTEMS: 512MB of RAM may be the suggested minimum, but think Gs if you want decent performance. www.computerworld.com/hardware

Psst, Wanna Save $140 on Vista?

WINDOWS: Microsoft confirmed the existence of a legal loophole allowing the installation of upgrade copies on PCs that shouldn't qualify.
www.computerworld.com/software

Microsoft Releases List of Verified Vista Applications

SOFTWARE: Some notable software packages are conspicuously missing.
www.computerworld.com/software

Cisco Router Vulnerability

SECURITY: Cisco Systems says 77 of its routers are vulnerable to a hack tactic known as "drive-by pharming," and the company urges users to change their routers' default passwords.
www.computerworld.com/security

BLOG SPOTLIGHT

What Would a Subnotebook Mac Look Like?

Rumor sites report that Apple may be adding a subnotebook to its portable lineup. Apple's past ultraportable products might offer some clues as to what that machine could be.
www.computerworld.com/blogs/node/5034

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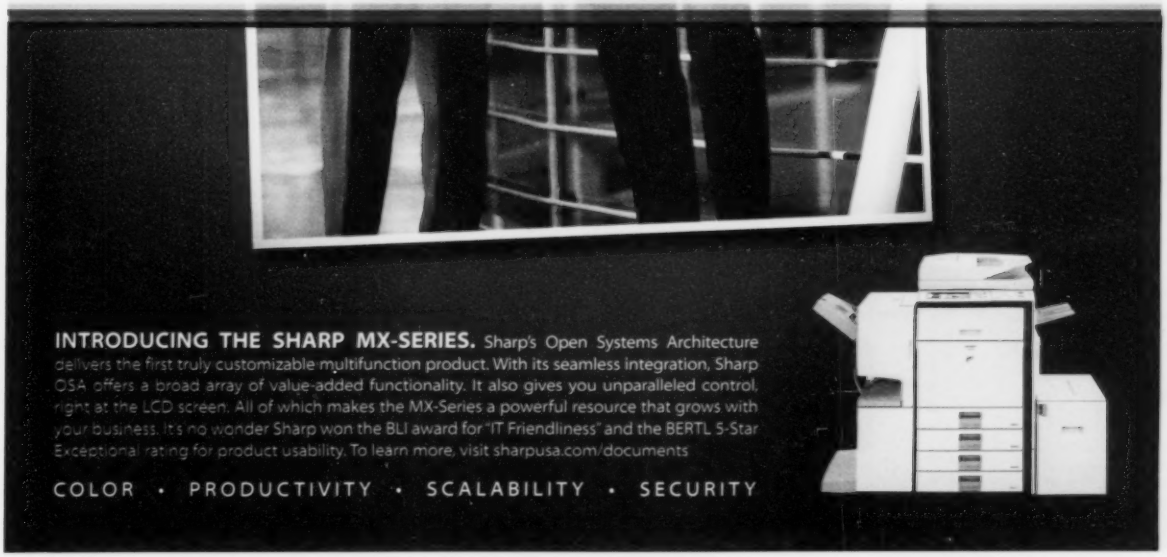

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AT DEADLINE

Microsoft Fined $1.5B in Patent Suit

A jury in federal court in San Diego has ordered that Microsoft Corp. pay $1.5 billion in damages to Alcatel-Lucent SA for infringing on patents for MP3 encoding and decoding technology. Alcatel-Lucent, then called Lucent Technologies, first filed suit in 2003 against Microsoft customers Dell Inc. and Gateway Inc. for infringing on 15 patented technologies it said were being used in the Windows client operating system. Microsoft said it will appeal the decision.

Veritas to Pay $30M For SEC Charges

Veritas Software Corp. has agreed to pay $30 million to settle charges by the Securities and Exchange Commission that it engaged in fraudulent accounting practices and aided Time Warner Inc.'s AOL LLC unit in committing fraud. Veritas, acquired by Symantec Corp. in 2005, agreed to pay the fine "without admitting or denying the allegations," according to an SEC filing.

Many Apps Not on Microsoft Vista List

Microsoft has released a list of 800 applications that have been officially verified to run bug-free on Windows Vista. The list compiled by the vendor does not include Adobe Systems Inc.'s line of graphics and multimedia software, Symantec security products, the Mozilla Foundation's open-source Firefox Web browser and the OpenOffice.org alternative to Microsoft Office.

Flaw Found in Google Desktop

Security researchers have disclosed a flaw in Google Inc.'s desktop software that could be used to wreak havoc on a victim's computer. Google has issued a patch for the bug, which was made public last week by Watchfire Corp. Watchfire first notified Google of the problem on Jan. 4, and a fix was produced on Feb. 1.

TJX Data Breach Worse Than Initially Reported

Occurred earlier, reached further than first thought

BY JAIKUMAR VIJAYAN

THE MASSIVE data breach disclosed last month by The TJX Companies Inc. was far worse than first reported, the company said last week.

An ongoing internal investigation into the breach has shown that intruders gained access to TJX's systems in July 2005, almost a full year earlier than first thought.

The investigation has also found that card transaction data from TJX-owned stores in the U.K and Ireland were affected by the intrusion, the company acknowledged. Previously, TJX had said only that it was "concerned" that the breach may have extended to those countries.

"We are dedicating substantial resources to investigating and evaluating the intrusion," TJX CEO Carol Meyrowitz said in a statement.

More than 50 experts from IBM and General Dynamics Corp., hired by TJX to shore up security in the wake of the breach, are investigating the incident, Meyrowitz said.

> "TJX is just the tip of the iceberg. . . . It's going to get a lot uglier before it gets any better."
>
> ALEX BAKMAN, CEO, ECORA SOFTWARE CORP.

TJX, owner of retail chains TJ Maxx, Marshalls and Bob's Stores, last month revealed that someone had illegally accessed a payment system and made off with card data belonging to customers in the U.S., Canada and Puerto Rico and possibly in the U.K. and Ireland. At the time, the company said the breach had occurred in May 2006.

TJX hasn't disclosed how many shoppers may have been affected by the breach. Some analysts believe the number could be in the millions.

Avivah Litan, an analyst at Gartner Inc., said the latest update by TJX could mean that officials are getting closer to finding the perpetrators.

"I think they have pinpointed [the intruders] to a large degree and may have found files indicating that 2005 [card] data was stolen," she said.

TJX's latest disclosure is not all that surprising and points to a broad lack of internal data controls at many large companies, security analysts said.

"When it comes right down to it, very few companies have effective controls to monitor internal systems closely and follow the movement of data" on their networks, said Alex Bakman, CEO of Ecora Software Corp., a Portsmouth, N.H.-based maker of compliance software. Therefore, such breaches can go unnoticed for a long time, he said.

"The underlying problem is that companies are treating security as a 'nice to have' as opposed to a 'must have,'" Bakman said.

"TJX is just the tip of the iceberg. I think we are going to see many more" such disclosures, he added. "It's going to get a lot uglier before it gets any better."

Joel Rosen, CEO of security vendor Tizor Systems Inc. in Maynard, Mass., said, "Many companies that relied on traditional security are just coming to terms with the fact that beefing up existing systems is not the answer."

The fallout from the breach has been widespread as U.S. and Canadian banks and credit unions have been forced to block and reissue thousands of cards. The New Hampshire Bankers Association has estimated that 20% to 30% of New England residents may have been affected by the breach. ▸

JetBlue Cites Overwhelmed IT Systems in Meltdown

BY LINDA ROSENCRANCE

JetBlue Airways Corp. last week acknowledged that faulty IT processes contributed to its decision to cancel more than 1,000 flights in the days following an ice storm earlier this month.

"For one [thing], we didn't have enough of our home-office employees or crew members trained on our reservation system," said Eric Brinker, a spokesman for the Forest Hills, New York-based airline.

"So while we were dispatching people to the airports to help, which was great, they weren't trained to actually use the computer system," he said. "So we're going through a process now where we're actively training those crew members."

The company's reservation system is hosted by Navitaire Inc., a Minneapolis-based provider of applications for airlines, said JetBlue CIO Duffy Mees. The crew-tracking system is from air-travel software company Sabre Holdings Corp. in Southlake, Texas, Mees said.

The airline is a Microsoft Windows-only shop and also runs mySAP ERP software from SAP AG, according to company information.

Brinker noted that in the midst of the crisis, JetBlue's IT department developed a database that quickly allowed the airline's scheduling team to improve its multitasking capabilities.

"They were receiving tons of phone calls from our crew members, and we created a database to enter the whereabouts of our crew members," he said. "That information would sync up with the information about the crew members that was in the main system.

"Now," Brinker said, "during a weather situation, our flight crews and flight hands can call us and give us the location of where they are, and we can start to rebuild the airline immediately using this tool."

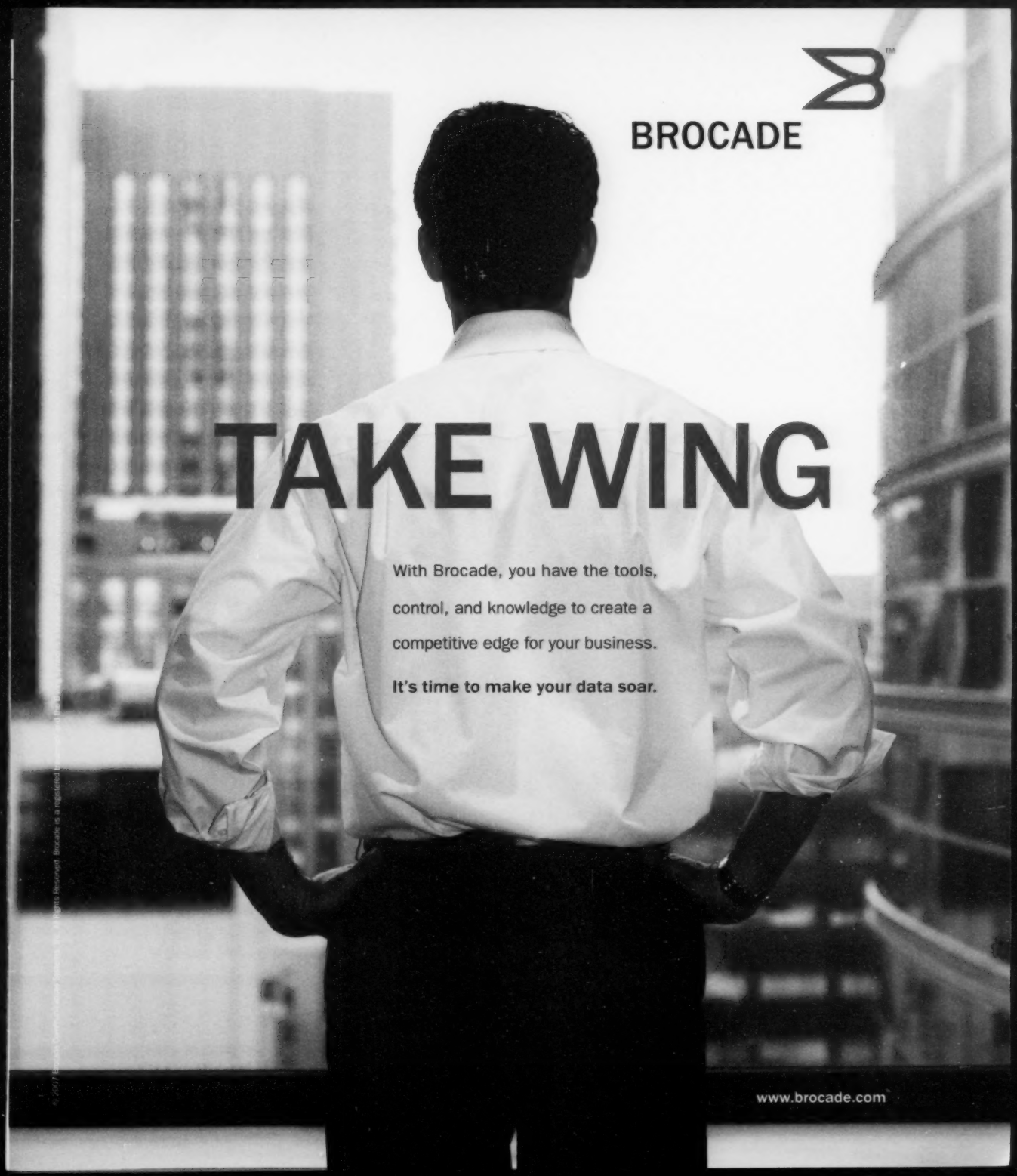
The system, which was developed in 24 hours and implemented in the aftermath of the Feb. 14 storm, is now running companywide, Brinker said. "It's a real behind-the-scenes improvement for both our crew members and customers," he noted.

Brinker said that JetBlue is also updating its IT systems to allow for improved communication with customers. For example, the company is working to push out automated flight alerts to customers via e-mail and mobile devices.

As a result of its problems following the storm, the airline last week issued a "customer bill of rights" citing steps that it would take in the event of future problems. ▸

PETE MARES

JetBlue's quick IT fix is now being used companywide.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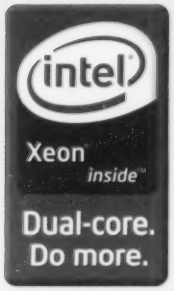

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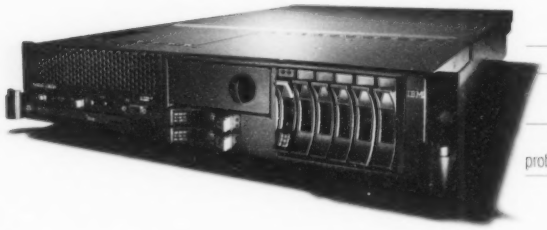

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New Intel Unit to Focus On Growing HPC Market

High-performance computing is a key market segment, executive says

BY PATRICK THIBODEAU

Intel Corp. late last year created a separate business unit to oversee the high-performance computing efforts under way at the company. The move comes as Framingham, Mass.-based IDC released research showing that the HPC industry, which is expanding at 9% annually, may be the fastest-growing computing segment. IDC expects HPC business to reach $14.3 billion worldwide by 2010. The new Intel unit's general manager, **Richard Dracott**, *discussed the HPC market and some of the company's plans for it in an interview with* Computerworld *last week.*

Why did Intel appoint a dedicated general manager for its HPC area? We primarily did this to increase the focus on what we see as an important and growing market segment.

How is this market getting broader? At one point, high-performance computing was the preserve of research areas and very high-end engineering organizations. What you are seeing, increasingly, is commercial application of this technology to help companies bring new products to market, primarily through areas of simulation. [Companies] like BMW and Boeing will do more computer-based simulation rather than continue to use wind tunnels, which take longer and are more expensive. In the commercial world, it's things like, "How do I mix a liquid? How do I model how the chemicals are mixed in there? How do I make sure that bottle will withstand any shock it may receive as it goes down the production line?"

What are some of the HPC projects under way at Intel today? Some examples of what we're doing are high-density designs that have twice as many processors in the same space in a single rack. We worked with third-party companies to come up with a design that has two CPUs on a board that's half the width of a normal board and put two of them side-by-side in a 1U design.

A different example is the software. In some clusters, it is necessary to reboot the node to either re-provision it in a different way or to clean it completely before you use it for some other purpose. We've come up with a technology that allows you to boot the platform much more quickly to a predefined state. That can actually get your boot time down by an order of magnitude. That is a product we have coming along at the end of the quarter.

In general, are Intel's HPC development efforts a testbed for what will appear in your business products? Absolutely. That's one of the motivations for increasing the integration of our HPC activities across Intel. For example, the terascale device [an 80-core chip that performs more than a trillion floating-point operations per second] is a technology development vehicle, but it gives you an idea of the kinds things that we're looking at for the medium term — four to five years — at the high end, but [we're also looking] long term down on the volume side of the product range.

How do user companies view their HPC operations – as something run by research divisions, or managed by IT? I think historically, a lot of the high-performance compute resources in the company have tended to be self-sufficient. But as you look at the broadening use of HPC, where companies that may not historically have had that capability in-house, it's sometimes more likely to come up within the existing IT environment. And that's why you see some increased interest in using Windows as opposed to traditional Linux in that space. ▸

Updated Google Apps Pose Threat to Microsoft Office

Features pique interest of IT execs

BY JUAN CARLOS PEREZ

Google Inc. last week unveiled an upgraded version of Google Apps, a hosted suite of business applications that some analysts said could soon become a serious competitor to Microsoft Office.

Priced at $50 per user per year, the new Google Apps Premier Edition is the third and most sophisticated version of the suite, which was first launched in August with two free editions.

The latest version offers guaranteed uptime, IT management tools, technical support, increased e-mail storage and integration with the Google Docs & Spreadsheets word processing and spreadsheet application, the company said.

Corporate users had mixed reactions to the offering.

"I played with Google Spreadsheets once not long ago," said Jim Prevo, CIO at Waterbury, Vt.-based Green Mountain Coffee Roasters Inc. "This may have promise down the road, but I'm not excited about it in any way at this time."

Corporate desktops serve many purposes, said Prevo, adding that he doesn't think they will be quickly displaced by Web-based office applications. "Google has a long way to go," he said. "I suspect they will be most useful for individuals who want to share documents with family members and friends. For that, I think they have an interesting product at this point."

> "[Google's business apps] may have promise down the road, but I'm not excited about it in any way at this time."
>
> **JIM PREVO**, CIO, GREEN MOUNTAIN COFFEE ROASTERS INC.

Forrester Research Inc. isn't telling corporations to drop Office, but it is recommending that CIOs evaluate Google Apps, in large measure because of the price tag of Office. Forrester analyst Erica Driver described Google Apps as a low-cost alternative to core Office applications.

The hosted software could replace Office in the long run, as CIOs get more comfortable with software as a service, she said. "Microsoft has a chance to respond, but this changes the game," Driver said.

The Procter & Gamble Co.'s global business services unit has been testing the new version of Google Apps but hasn't decided whether to use it. "We are still looking to see if there are applications for the product within the company," said a spokeswoman for the unit.

Camden Daily, technology director at Prudential Preferred Properties Inc., said his company is feeling a price sting with Microsoft Office. The real estate company pays between $350 and $400 per license, he noted. "We have instances in which the Office license was more expensive than the PC it's on," Daily said.

Google Apps found its way into Prudential, which has 450 employees, as an alternative to a corporate e-mail service that constantly malfunctioned. Prudential has been using the free Standard version but is willing to pay for the Gmail service. "Everything on top of that is just a bonus," he said.

Kirk Gregersen, director of Microsoft's Office team, pointed out that Office customers have had less-expensive alternatives, even free ones, for years but have still chosen Office for factors beyond cost.

Google believes its Premier Edition can be a good complement to Office, and it sees a big opportunity in organizations that haven't been able to justify the cost of offering e-mail to some employees, particularly in retail and manufacturing, said Dave Girouard, vice president and general manager of Google's enterprise unit.

The company also plans to create an ecosystem of partners and developers around Google Apps, he said. ▸

GOOGLE APPS

Premier Edition

- 10GB of storage with every purchase
- APIs for business integration
- Service-level agreements for high availability of Gmail, with Google monitoring
- Round-the-clock support for critical problems
- Google advertising turned off by default
- Google Docs & Spreadsheets application
- Gmail support for mobile devices
- $50 per user account

SOURCE: GOOGLE INC.

Perez is a reporter for the IDG News Service. Computerworld's *Linda Rosencrance contributed to this story.*

BRIEFS

SanDisk Plans to Cut Workforce, Exec Pay

SanDisk Corp. said it must cut its workforce by 10%, or 250 jobs, because NAND flash memory component prices have fallen 50% in the past two months. The company said the layoffs will begin in early March. It also plans to cut the pay of top executives by up to 15% and freeze salaries for other employees.

SP2 for SQL Server 2005 Is Available

Microsoft Corp. has released Service Pack 2 for SQL Server 2005. The company also said it will allow unlimited virtual instances of the SQL Server SP2 database to run on servers that are fully licensed for SQL Server 2005 Enterprise Edition. The new SQL Server 2005 SP2 will be the only release of the database supported on the Windows Vista operating system and upcoming Longhorn server software, which is due for a final release by the end of 2007.

HP Sales, Profits Top Analyst Expectations

Hewlett-Packard Co. topped Wall Street's expectations as its revenue rose 11% in the first quarter of its 2007 fiscal year, which ended Jan. 31.

HP BY THE NUMBERS

	REVENUE	%
Q1 '07	$25.1B	$1.5B
Q1 '06	$22.7B	$1.2B

Adware Firm, FTC Settle in $1.5M Deal

Adware distributor Direct Revenue LLC agreed to pay $1.5 million to settle charges filed by the Federal Trade Commission. The FTC had charged that the company used "unfair and deceptive methods to download adware onto consumers' computers and then obstruct them from removing it." In a similar agreement in November, Zango Inc. – formerly 180solutions – agreed to pay $3 million to the FTC.

ON THE MARK

HOT TECHNOLOGY TRENDS, NEW PRODUCT NEWS AND INDUSTRY BUZZ BY MARK HALL

MATTHEW FAULKNER

Skip Patch Tuesday Frenzy . . .

. . . with an appliance designed to ensure that network traffic is valid. Gregory Ness, vice president of corporate marketing at Blue Lane Technologies Inc. in Cupertino, Calif., says that since Microsoft Corp. introduced Patch Tuesday into the IT lexicon, systems administrators have dreaded that day even more than Mondays. Add regular patch dates from Red Hat, Oracle, Sun Microsystems and others — not to mention out-of-turn patches for zero-day exploits — and IT admins either don't patch or, having no time to the test patches for production systems, apply the patches and cross their fingers. "There's a feeling that the other guy is going to get attacked first," Ness says. Allwyn Sequeira, vice president of engineering and operations at Blue Lane, says the PatchPoint appliance looks at network traffic to determine whether it is in violation of the latest patches. If incoming traffic, say, threatens to create a buffer overflow, the device addresses that problem before sending the data through, nullifying the exploit. "We don't care about the payload," Sequeira says. He adds that PatchPoint's only task is to keep all traffic compliant with patches, which are updated daily. By Q3, Blue Lane will add support for MySQL. Pricing for the appliance starts at $10,000.

The PatchPoint device "patches" traffic and not systems.

Orchestrate SOA app tests . . .

. . . so your programs play well together. Most service-oriented architecture applications run through scripted tests that have been hand-coded, claims Ken Gardner, founder of SOASTA Inc. in Mountain View, Calif. Not only is that testing method time-consuming, but it's also potentially error-prone, he says. Automated testing tools are better, but most today are designed for "a different architecture and a different time," says Gardner. "A message-based world needs a special message-based testing tool." And he says he has one in Concerto, which becomes generally available next month. The browser-accessible service uses a visual timeline, similar to those in consumer software such as Garage Band. In Concerto's Composition Editor, developers can drag and drop predefined or custom test loads into a timeline to bang away at XML, SOAP, HTTP and all manner of SOA components. You can control the sequence of test parameters and their timing "down to the millisecond," Gardner says. Pricing starts at $250 per month.

GARDNER: Compose and run SOA tests with a visual tool.

Federated CMDB inches closer . . .

. . . to standardization. Six major vendors — BMC Software, CA, Fujitsu, Hewlett-Packard, IBM and Microsoft — have agreed in a white paper on the outline of what a federated configuration management database (CMDB) would look like. According to Marv Waschke, senior technology strategist at CA, a CMDB will give providers of management data repositories standard interfaces to register resource information, make changes and handle queries and other tasks. Until now, he says, if you wanted to integrate CMDB-related information between different systems, "it was a one-off job between, say, Tivoli and Patrol, and the work could not be duplicated." The next goal of the CMDB Working Group is to create the specifications for implementing a CMDB. Waschke says to expect a complete specification by early 2008. He thinks this advance is more than just a footnote in IT history. In fact, Waschke contends, "the CMDB is going to do more to integrate IT management than anything in my career."

WASCHKE: CMDB is the best thing ever for IT management integration.

Green thinking for data centers . . .

. . . dawns on vendor consortium. Today, The Green Grid, a newly formed consortium, will announce a set of initiatives intended to make data center systems more energy-efficient. The Green Grid includes data center technology suppliers Advanced Micro Devices, American Power Conversion (APC), Dell, HP, IBM, Intel, Microsoft, Rackable Systems, SprayCool, Sun Microsystems and VMware. The group plans to create common definitions and metrics for users and vendors. According to John Tuccillo, director of global data center systems at APC in West Kingston, R.I., and a member of The Green Grid's board of directors, one of the group's thorniest tasks will be defining terms — even basic ones such as *efficiency*. "What we all thought we knew, it turns out we all had a different spin on," he says. Board member Rick Schuckle, a senior technical staffer at Dell, says The Green Grid intends to spur energy-efficiency in everything from microprocessors and servers to cooling systems and systems management. Initially, The Green Grid will offer users a package of best practices, such as ways to find "stranded capacity" within your operations. Sign up at *www.thegreengrid.org*.

45B

Kilowatt hours used by U.S. data centers in 2005, says a study by Jonathan Koomey, a scientist at Lawrence Berkeley National Lab.

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BRIEFS

Blade.org Start-ups Get $1B Investment

Venture capitalists have invested $1 billion in start-up companies belonging to Blade.org, a year-old organization formed to push blade technology. Walden International, for example, has invested $100 million in start-ups and early-stage companies that are members of the organization. Blade.org includes 100 mostly U.S. companies that sell processors, software, networking equipment and other technology for blade servers. The group is backed by IBM.

SAP Buys Business Software Maker

SAP AG has agreed to acquire privately held Pilot Software Inc., a maker of strategy management software in Mountain View, Calif. Terms of the deal were not disclosed. SAP said it plans to integrate Pilot's core product, a business analytic application called PilotWorks, into its suite of products that run on the SAP NetWeaver platform.

Wind River Buys RTLinux Patents

Wind River Systems Inc., a maker of software development tools for embedded systems, has agreed to acquire the patents, copyrights and trademarks for RTLinux, real-time Linux technology developed by Finite State Machine Labs Inc. Wind River also acquired the rights to future runtime revenue streams from RTLinux customers running embedded applications. Terms of the deal were not disclosed.

ACM Honors IBM Computer Scientist

The Association for Computing Machinery has named Frances Allen, a computer scientist at IBM, as winner of the A.M. Turing Award for her work in automatic program parallelization, which allows programs to use multiple processors to improve speed. The ACM said the work of Allen "contributed to advances in the use of high-performance computers."

Wal-Mart Shifts RFID Plans

Emphasis now on stores rather than distribution hubs

BY MARC L. SONGINI

THOUGH WAL-MART Stores Inc. expects the number of its stores using radio frequency identification systems to reach 1,000 in April, the retailer has come under fire from some analysts and users for failing to meet its plan for installing the technology in its distribution centers.

A spokesman last week acknowledged that the company missed its goal of installing RFID technology in 12 of its 137 distribution centers by the end of 2006. Simon Langford, director of RFID and transportation systems at Wal-Mart, said the missed goal reflects a change in course by the company to instead concentrate on RFID-enabling its retail stores.

Along with the U.S. Department of Defense, Wal-Mart is widely seen as one of the world's top drivers of RFID technology. Wal-Mart began its RFID journey early in this decade, when it mandated that its 100 top suppliers start tagging all cases and pallets carrying merchandise by January 2005. Wal-Mart officials said 600 of its suppliers are currently RFID-enabled.

Despite the missed deadline for installing the technology in the distribution centers, Langford insisted that Wal-Mart's overall RFID effort is on track and has been successful so far. "We're accelerating [RFID adoption] and at a greater pace than last year," he said.

Cost vs. Benefits

However, Michael Liard, an analyst at Oyster Bay, N.Y.-based ABI Research, said the shift in strategy could slow Wal-Mart's effort to boost the visibility of its supply chain.

Having RFID technology in the distribution centers would let the company mark merchandise as it arrives from its suppliers, Liard said.

But when they're sitting in the non-RFID-enabled distribution centers, the items are invisible, so Wal-Mart wouldn't get the full benefits of RFID technology in its supply chain, he added.

A Wal-Mart spokesman said the chain's RFID effort has been successful.

"For me, it presents a problem," Liard said.

Langford, however, argued that first installing RFID technology in its stores allows the retailer to better collaborate with suppliers that need to monitor the flow of inventory and respond to problems or spikes in demand.

Also, Langford said, store personnel can better use the technology to keep the shelves full of merchandise and reduce the number of products out of stock at each store. Wal-Mart expects to have rolled out RFID to 1,000 stores by the end of April, up from 100 in January 2005.

"We're focused on the store level," said Langford. "If we focused internally [at the distribution centers], it would provide no value to our suppliers. When we set out on this journey, we really focused on the collaborative benefits; we wanted what was going to drive sales for our suppliers and to get product on the shelf, where it needs to be for our customers to buy."

Langford credited the use of RFID technology with cutting the incidence of out-of-stock products by 30% while improving the efficiency of moving products from backrooms to store shelves by 60%.

"RFID in our stores is going to drive the initial value," he said. "We see distribution centers as coming onstream a bit later."

Langford wouldn't estimate when the technology will be installed in all of Wal-Mart's distribution centers. He noted that the five current implementations have already helped improve the efficiency of the company's supply chain.

Nevertheless, he said, "we needed to remain focused on the stores and store associates and help them move freight to the shelf."

Procter & Gamble: Wal-Mart RFID Effort Effective

ONE OF WAL-MART'S top providers of consumer goods has found success by following the RFID requirements of the retailer.

The Procter & Gamble Co. in Cincinnati, one of the first 100 suppliers to comply with Wal-Mart's requirements to tag its products with RFID chips, has improved the accuracy of its deliveries to the retailer, particularly during time-sensitive promotions, according to Paul Fox, a spokesman for P&G Global Operations.

"Ensuring that the right product is at the right place at the right time is priceless," he said.

In addition, Fox said, "we have seen significant benefits within our own four walls. It's helping streamline processes and making them more efficient. We know what we're about to ship, and there are no errors and no picking the wrong case and no miscounting."

RFID technology has offered significant improvements over bar-code systems, Fox said. For example, he noted that workers can't scan the same RFID tag twice because each one has a unique identifier. Bar-code technology lacks those capabilities, he noted. RFID automation has also allowed P&G to speed the process of moving products to a distribution center: It took 20 seconds to manually tally bar-code data on a pallet versus five seconds to read the RFID technology, Fox said.

The cost of each tag is less than 10 cents, making the technology economically viable, he said. RFID tags cost $2 each in 1999, Fox noted.

He said P&G's overall investment in RFID technology, which he would only say was multiple millions of dollars, has been recovered. "Fundamentally, it's been a fruitful collaboration between ourselves and Wal-Mart," Fox said.

Some analysts remain unconvinced that the Wal-Mart RFID program will prove beneficial to all suppliers. Michael Liard, an analyst at ABI Research, said that more data is needed to determine whether RFID technology is significantly more cost-effective than bar-code systems.

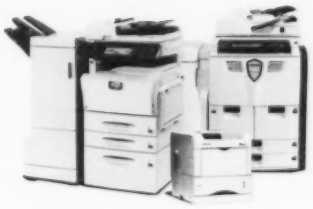
Simon Langford, director of RFID and transportation systems at Wal-Mart, said the second generation of RFID technology has improved performance and accuracy for the retailer.

Langford acknowledged that the company's top 100 suppliers, which went live with the technology during 2005, faced some challenges while learning how to use it. Smaller suppliers that implemented the technology later on benefited from lessons learned by the earlier adopters, he said.

– MARC L. SONGINI

Printing in color.

Savings in black & white.



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Continued from page 1

Global IP Net

side your own company."

GM began insisting that IT vendors agree to follow standard IT processes a year ago, when the automaker started awarding $15 billion in IT outsourcing contracts to Electronic Data Systems Corp., Hewlett-Packard Co., IBM, Wipro Ltd. and others.

The real end goal is that every employee has the same type of capabilities no matter where they are in the world.

RALPH SZYGENDA, CIO, GENERAL MOTORS CORP.

Paul Roehrig, an analyst at Forrester Research Inc., said GM's approach to outsourcing is smart because it "streamlines the management of all the other governance contracts." He said the strategy has been used by other large organizations that have enough buying clout to insist on process standards, such as NASA.

The approach isn't without risks, however, especially if a conflict of interest develops when a vendor like AT&T is managing a competitor, Roehrig said.

AT&T currently provides GM with a global virtual private network and is building an IP network based on Multiprotocol Label Switching technology, which enables network traffic to be managed by priority.

Szygenda said GM's decision to go with MPLS technology was a "good bet" for the company when it was made about four years ago. "Now the next five years is really taking it to a totally different level," he said, noting that new initiatives will involve building out the capabilities of the MPLS network, integrating voice, data and video, and managing it as one system.

Work on the integrated IP network is under way, said Ron Spears, executive vice president of AT&T global business sales, adding that it will take about 18 months to reach the point where GM is "running effectively a complete IP infrastructure environment on a global basis."

The goal is to give GM workers everywhere a consistent technology experience. "At its simplest level, there will be a voice-mail platform that will look the same to every General Motors employee around the world" — and that isn't a trivial goal, Spears said.

Historically, "it's been a hodgepodge of systems mostly built by the regional entities, and that's true in most enterprises today," he added.

Szygenda said GM engineers and support staffers work as teams, so the company can't have separate telecommunications and management systems supporting them.

"That doesn't work when you are running a real-time global company," he said. "You don't want to have any differences.

"The real end goal is that every employee has the same type of capabilities no matter where they are in the world," Szygenda said. "And in fact, when they wake up, they don't need to know where they are in the world. It just works."

GM has manufacturing operations in 33 countries, and its vehicles are sold in 192 countries, according to the company's Web site.

A Closer Look

GM's network outsourcing contract with AT&T is aligned with several of the anticipated outsourcing trends for 2007:

- Renewals remain popular: 80% of outsourcing contracts are renewed with the incumbent provider.
- Large multinational organizations tend to use big service providers with a similar global presence.
- Network outsourcing is the fastest-growing part of the IT infrastructure outsourcing market.
- Organizations turn to network outsourcing because of their reluctance to manage the complexity of networking technologies.

SOURCE: GARTNER INC., DECEMBER 2006

Continued from page 1

Virtual Fence

the northern and southern borders.

In recent hearings, two congressional Democratic leaders have questioned the way the Boeing contract is managed. One hearing was held two weeks ago before the House Homeland Security Committee.

Rep. Bennie Thompson (D-Miss.), chairman of the House homeland security panel, took note of the 65-page GAO report questioning the management of SBInet. "After reading the GAO assessment of SBInet, it seems that the department's scattershot approach of issuing different, interdependent task orders simultaneously leaves the program vulnerable to collapsing on itself, like a house of cards," he said.

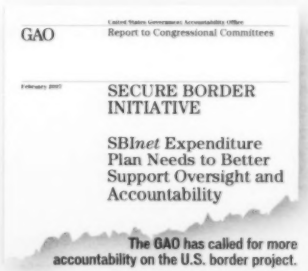
In a Feb. 8 hearing, Rep. Henry Waxman (D-Calif.), chairman of the House Oversight and Government Reform Committee, warned that SBInet could be subject to waste and abuse, given how the DHS is relying on Boeing and private contractors to design, build and even conduct oversight of the project.

"There seems to be no task too important to be outsourced to private contractors," Waxman said. More than half of the 98 staff members hired by the DHS to oversee the new SBInet contract are private contractors, he said, and some of them work for companies that are business partners of Boeing, the company the staff members are overseeing.

The GAO said the DHS needs to tighten oversight and accountability of SBInet with "explicit and measurable commitments" for costs and scheduling.

The GAO also said the actual SBInet contract should include quantifiable limits beyond the unclear statement about funding "6,000 miles of secure U.S. border."

Waxman put the Boeing contract's value at $30 billion in a statement issued at the Feb. 8 hearing.


United States Government Accountability Office
Report to Congressional Committees
GAO
February 2007
SECURE BORDER INITIATIVE
SBInet Expenditure Plan Needs to Better Support Oversight and Accountability

The GAO has called for more accountability on the U.S. border project.

DHS Defends Stance

Officials from Boeing and the DHS testified before the two committees and have partly addressed the concerns raised by the congressional leaders and the GAO.

Regarding the ultimate costs, the DHS repeated its "6,000 miles of secure U.S. border" upper limit to the GAO, and a DHS spokesman reiterated that language in an interview last week.

A DHS spokesman said the department has already taken steps to validate the SBInet contract independently. Its chief procurement office certified last November that Boeing had established procedures to prevent conflicts of interest between the company and subcontractors, according to the DHS.

NEWSCOM: STOCK CONNECTION WORLDWIDE

Boeing will install technology such as cameras and radar at U.S. borders.

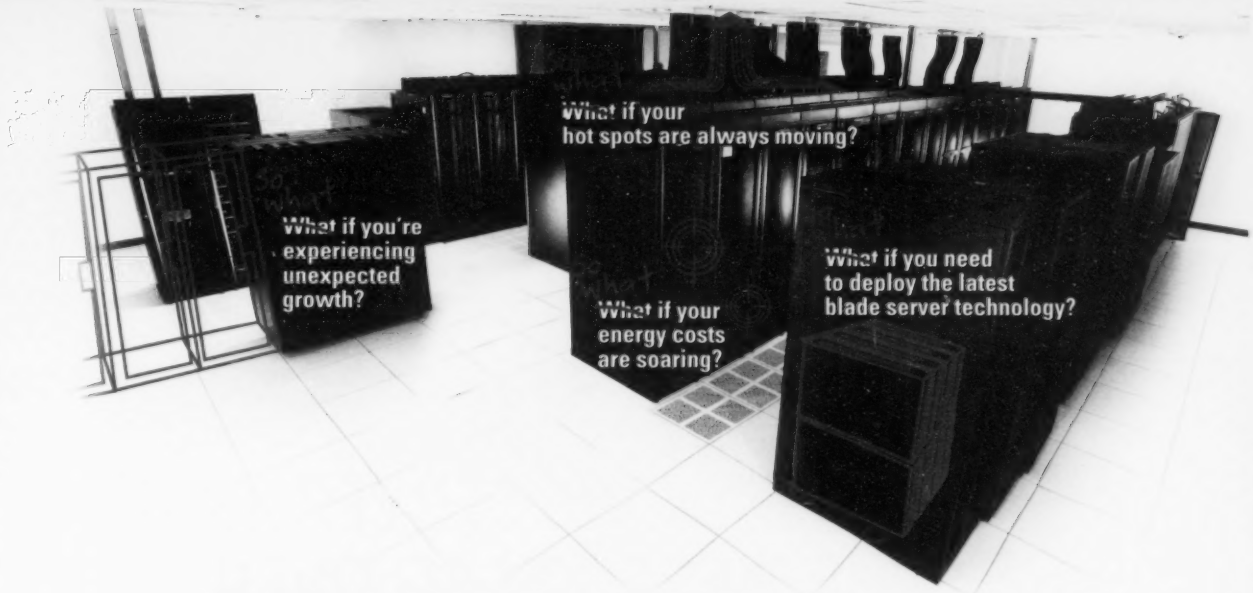
As for Thompson's criticism about task orders being issued simultaneously, Kia Evans, a spokeswoman for U.S. Customs and Border Protection, stated that the DHS is proceeding "with a sense of urgency on this critical national issue" of border security while remaining sensitive to House concerns.

Boeing's vice president and program manager for SBInet, Jerry McElwee, updated Waxman's committee on Feb. 8, stressing that the government, not Boeing, will set requirements for the entire program.

"We do collaborate extensively [with the government], but the final decision is made by the government," he said.

Project 28, a task order for a 28-mile stretch of border near Sasabe, Ariz., has started, McElwee testified. The order calls for equipping a mobile tower with new technology by mid-June, he said. The DHS has put the cost of Project 28 at $20 million.

McElwee said Boeing is trying to address a variety of terrains and threats, using a "tool kit" approach with different combinations of sensors, communications systems, IT, and command and control capabilities, depending on the area.



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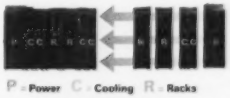

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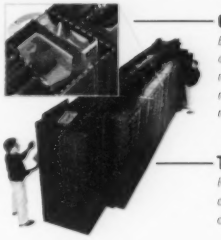

Close-coupled cooling method

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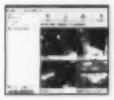

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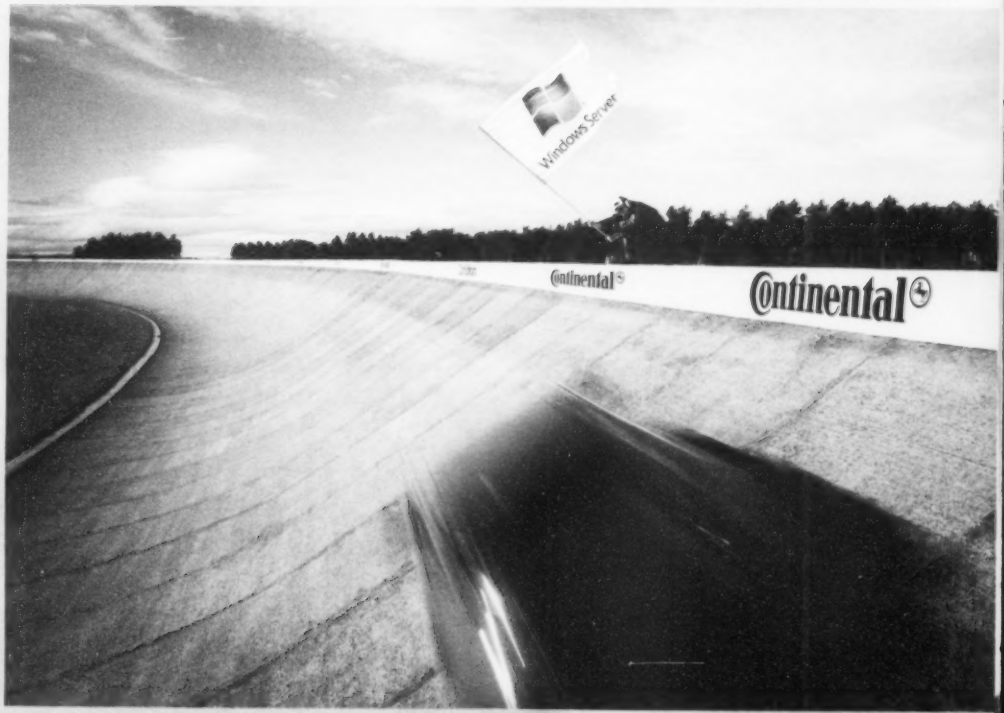
The Highly R

VOLUME 1 – ISSUE 2

Windows Server 2003

For all stories go to

WINDOWS SERVER TAKES CHECKERED FLAG OVER LINUX



Tom Nagy for The Highly Reliable Times

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Microsoft

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special edition

New System Gives Global Automotive Supplier 99.9% Reliability

By MICHAEL BETTENDORF

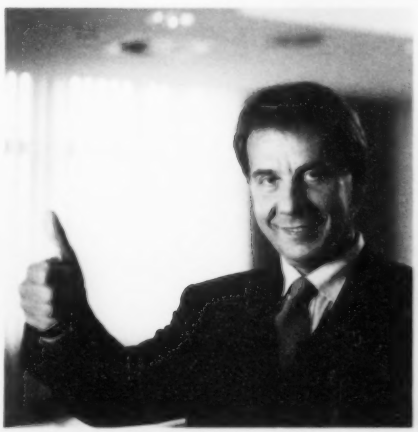
HANOVER, Jan. 2007 – "We needed rock-solid reliability, and we weren't getting it from our legacy infrastructure," says Paul Schwefer, CIO at Continental AG, one of the world's largest automobile suppliers with over 85,000 employees worldwide. Inadequate management tools made it difficult for Schwefer's team to keep system uptimes at the high levels expected at Continental AG, so a change in platform was necessary.

Initially, a Linux solution was considered. However, after a thorough evaluation, Schwefer's team determined that Linux could not deliver the reliable, predictable environment Continental AG required. Instead, they chose Microsoft® Windows Server® 2003.

With key features of Windows Server 2003 such as group policy management, Schwefer found clear advantages over a Linux-based solution. "Windows Server provides a reliable environment with centralized administration and management," said Schwefer, who believes that superior manageability leads to high reliability. "Duplicating this level of service in a Linux-based environment would have been very difficult and more costly," he says.

The decision has proven successful: Since the implementation, Windows Server 2003 has provided 99.9% reliability in a distributed environment for Continental AG. For the full Continental AG case study, plus other case studies and independent research findings on the reliability of Windows Server versus Linux, visit microsoft.com/getthefacts

RELIABILITY NEWS & NOTES: A study



BREAKING NEWS: Reliability linked to cheerfulness in IT professionals

In a trend with global implications, IT professionals such as Continental AG CIO Paul Schwefer show obvious signs of exuberance (see above) due to high Windows Server reliability.

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CONTINUED GROWTH: More and more

GLOBAL DISPATCHES

An International IT News Digest

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Police charged that the PCs contained more than $10,000 (U.S.) worth of pirated Microsoft software, but Ponosov maintained his innocence, claiming that he bought the computers with the software preinstalled.

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SOURCE: XMG INC., VICTORIA, BRITISH COLUMBIA

Kuwaiti Firm Creates $10.5B African Fund

KUWAIT CITY

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Celtel offers mobile phone services in 14 African countries.

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The company plans to begin spending the fund this year in several countries where Centel has offices, according to Al-Barrak.

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Nokia Plans Shakeup; 700 Workers Affected

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Those affected include 360 employees in Nokia's enterprise solutions business group, 140 in the software platforms area of its technology platforms unit, 130 in the global IT operations division, and 30 in the customer and market operations group, the company said.

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"It's very clear we will need to make that business profitable," said Olli-Pekka Kallasvuo, president and CEO of Nokia, during a press conference at the 3GSM World Congress in Barcelona. "We're looking at different options in order to do that."

Nokia said it is also seeking greater efficiency in the research and development operations of its technology platforms unit.

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MELBOURNE, AUSTRALIA

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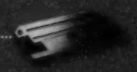

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Medical Center Tests Dual-Mode Phones

BY MATT HAMBLEN

DOCTORS AT the University of California, San Francisco Medical Center prompted their IT staff to launch a pilot project that could lead to a widespread implementation of dual-mode phone technology.

Plans for the project were announced by hospital officials last week.

David Sproul, manager of capital projects and emerging technologies at the UCSF Medical Center, said the project aims to let hospital staffers maintain telephone contact with callers using a single handset as they walk from place to place throughout the complex. The medical staff asked for that capability, he said.

"The project started in a serendipitous way, when a couple of physicians wanted to use their cell phones outside and walk into the building, where there are normally dead zones, without dropping the call," Sproul said. "This [project] was really driven by requests and needs of physicians."

The three hospitals that are part of the medical center have many cellular dead zones, he said, noting that some of the buildings are up to 16 stories tall and have steel bracing to protect against earthquake damage and lead-lined walls to contain radiation, he said.

The medical center has a large Wi-Fi network with about 800 access points providing coverage virtually everywhere inside its buildings, Sproul said. "We wanted to take advantage of that," he said.

The hospital will first evaluate technologies that promise to allow calls to move seamlessly between cellular networks and the hospital's Wi-Fi network, Sproul said.

The medical center is about to start the second stage of a planned four-stage effort by testing a line of new dual-mode products from DiVitas Networks in Mountain View, Calif.

The products, which DiVitas unveiled last week, include a Mobile Convergence Appliance that is deployed in a data center and Mobile Convergence Clients that are deployed on handsets, the company said.

The MCA 1000 appliance with a 10-user MCC license starts at $5,495 and is available now.

Four Launching Stages

Sproul said that the UCSF Medical Center has completed the first stage of the effort by validating in a lab test that the DiVitas technology could work adequately with the center's Cisco Systems Inc. wireless access points and its Siemens AG HiPath 4000 voice switch technology.

The second stage of the project began earlier this month with a small deployment of the DiVitas technology for six medical center IT workers, Sproul said. The test deployment is expected to continue for about 60 days, he said.

The third stage, also expected to last about 60 days, involves rolling out the technology to facilities workers at multiple sites at the medical center, Sproul said.

The fourth and final phase will involve rolling out the technology to physicians by the end of this year, he said.

The medical center expects the first parts of the effort to cost about $250,000, Sproul said. The amount of any additional costs will depend on the results of those efforts, he noted.

UCSF Medical Center's pilot project could lead to a widespread implementation of dual-mode phone technology.

Medical center officials hope that in addition to maintaining links to calls across the cellular-to-Wi-Fi boundary, the new system will enable hospital staffers to use just one device instead of multiple phones. That would result in a cost savings, Sproul said.

"We're not sure how much we'll save, but our goal was to provide functionality to users," he said.

If the early phases of the project are successful, Sproul said, hundreds of medical center employees could ultimately be affected by the project. He noted that about 400 cell phones and nearly 900 additional SpectraLink phones working are in operation at the medical center facilities over the Wi-Fi network.

In addition, he said that nearly 1,100 long-range pagers could be replaced by the new technology if the tests are successful.

DiVitas said its new gear works alone or with PBX voice systems and can interoperate with any Wi-Fi infrastructure.

The technology also supports dual-mode phones, Wi-Fi-only phones, cellular-only smart phones, and softphones running on PCs or other devices, the company said.

The MCC client software can be downloaded over the air to the handhelds, DiVitas said.

Jenny Craig Beefs Up Security on 500-Site WAN

BY MATT HAMBLEN

Weight management company Jenny Craig Inc. needed to upgrade its WAN to improve the security and availability of data sent daily from 500 locations in North America to its headquarters.

Data privacy was the most important consideration as the company studied upgrade paths, noted Alessandra Nicoletti, director of strategy at Jenny Craig.

Nicoletti said that the data sent from the company's weight management centers to its headquarters facility in Carlsbad, Calif., contains private information about customers, including their weight and the steps they are taking to manage it.

"We needed to figure out a secure solution for polling data and doing it quickly over the Internet with a fail-over solution," said Nicoletti.

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>
> ALESSANDRA NICOLETTI, DIRECTOR OF STRATEGY, JENNY CRAIG INC.

Last year, Jenny Craig hired Las Vegas-based Igmas Technologies Inc. as a systems integrator. Together they chose SonicWall Inc. in Sunnyvale, Calif., to provide WAN security technology for the project. The SonicWall technology includes hardware and software that allows deep packet inspection for viruses, along with management and monitoring capabilities, Nicoletti said.

Earlier this month, SonicWall TZ Series Internet security appliances were deployed at about 53 of the Jenny Craig centers, she said.

The appliances are used to transmit data from Wi-Fi access points to the company's headquarters via Digital Subscriber Line. "DSL has been sketchy, so we needed fail-over to dial-up," which the TZ Series appliances also provide, said Nicoletti.

The appliances are slated to be deployed at all 500 Jenny Craig locations within about six months, she said.

In addition to fail-over, the appliances offer Triple DES encryption, Nicoletti noted. "No way can anybody get to the data," she said.

The SonicWall appliances have enabled the company to do away with two positions dedicated to handling the older dial-up-only transmissions, Nicoletti said. One of the affected workers has left the company, and the other was assigned to other IT tasks, she said.

Jenny Craig has also installed two SonicWall Pro Series 5060 gigabit firewalls at the corporate data center in its headquarters facility. The Pro Series appliances are used to monitor the appliances in the field and will eventually allow the company to deploy security policy configurations on the full 500-center network, according to Igmas.

Each of Jenny Craig's local facilities will connect over a WAN back to one of the firewalls in a high-availability fail-over configuration, Igmas said.

Nicoletti would not disclose the cost of the project, but she said several firewall technologies were evaluated, and SonicWall "gave us the best bang for the buck."

She said that Jenny Craig considered competing offerings from Fortinet Inc. and Cisco Systems Inc. At the time of the evaluation, she said, the Cisco offerings did not incorporate Triple DES encryption capabilities.

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DON TENNANT

'China Apologist'

I GOT such a kick out of a review of *Computerworld* that's posted on Amazon.com that I just had to share. For one thing, I feel like a proud papa because the reviewer lavished so much praise on the crew here. There's another, more entertaining reason, but I'll get to that in a moment.

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DON TENNANT is editor in chief of *Computerworld*. Contact him at **don_tennant@computerworld.com**.

The reviewer, who describes himself as a longtime IT professional, gives us four (out of five) stars, and headlines his review with the statement, "Very current, in-depth reporting and high writing standards make this my favorite IT periodical." Noting that *Computerworld* is the only IT publication he reads regularly, he effuses that it's "relevant, smart, and covers an almost impossible range of topics in a very broad IT world."

Now, here's the entertaining part — the reviewer's final paragraph:

"My biggest problem has to do with the Editor in Chief. I hardly ever agree with Don Tennant's editorials, and think he's more of a China apologist than anything else. Still, his magazine is a very good one, and worth reading for anyone in the IT industry who needs a really good view of what's going on today. I can tolerate his dumb opinions, so long as the rest of the magazine remains so good."

I guess I got a kick out of it because it was so blunt and brutally honest, as any worthwhile review should be, and because the newsroom is likely to have some fun with it. I'm fully expecting to be called "Chap" (short for "China apologist") for a while.

I suppose the reviewer labeled me that way because of the positions I've taken on such matters as China's rights relating to Google's operations there (it's not our place to dictate what the Chinese government should or shouldn't censor in that country) and the outcry here over IBM selling its PC business to Lenovo (Lenovo's China connection doesn't make it a security nightmare, so try to relax).

For the record, I'm disinclined to serve as any country's apologist. I would imagine there are very few countries on the planet that aren't doing something that warrants justification to the rest of the world, so I see no reason to single out any one of them as being in particular need of an apologist.

But if we are going to single China out, consider this: If you've been to Beijing, you know that there are two slogans emblazoned across the entrance to the Forbidden City. The one on the left reads, "*Zhong Hua Ren Min Gong He Guo wan sui*," or, "Long live the People's Republic of China." No big shock there.

But then there's the one on the right. It reads, "*Shi jie ren min da tuan jie wan sui*." It means, "Long live the unity of the peoples of the world."

I was born in Washington, and I've spent a lot of time in our capital city. To my knowledge, there's not an inscription on any of our buildings or monuments there that conveys that sentiment of international harmony. If there is, it's certainly well hidden. We don't need an apologist to justify that. But it wouldn't hurt for us to think a little more along those lines.

Don Tennant

VIRGINIA ROBBINS

Wrapped Up In PITAs

"WHAT A PITA!" my friend exclaimed as she sailed around the corner. She was 15 minutes late, and I had almost given up on her.

"Pita?" I asked. "What does bread have to do with your being late?"

She burst into laughter. "No, not the bread — the parking attendant. He was a pain in the ass — a real PITA."

In a world overrun with acronyms, *PITA* — the people we interact with who cause us pain — is a welcome addition. But what can we do about these people? Here's a rundown on the most prominent PITAs in the workplace:

The customer PITA: One of my part-time jobs in college was as a teller at a local bank that catered to students. My supervisor told me it was my job to make sure that all my customers left my window with a smile. Whatever their problem was, I had to help them solve it. I was to always smile and answer their questions, no matter how redundant or stupid. I was to use information to turn PITAs into better customers.

VIRGINIA ROBBINS is a consultant helping banks complete data conversions. She has served as a CIO for 12 years. You can contact her at **vrobbins@sbcglobal.net**.

If a situation got too bad, I was supposed to get my supervisor so she could solve the problem. Often, her response was to request that the customer close his account, which was the equivalent of firing the customer. I have applied that idea to my business life. If I have a customer who is too much of a PITA, I fire him. If I can't fire him, I move him to someone else.

The boss PITA: In general, if you have a supervisor who is a PITA, then from the organization's viewpoint, the real PITA is most likely you. A few supervisors are genuine PITAs, but they don't last long. If your supervisor has been in place for over a year, then he is probably acting in a way desired by your company. The best thing to do is

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INDUSTRY EXPERTS:

Jim Steele
President Worldwide Sales & Operations, Salesforce.com

Dave Duffield
CEO and Co-founder of Workday

Art Wong
Senior Vice President, Symantec

Jeffrey Nick
EVP & CTO, EMC Corporation

Paul Johnston
CEO, Entellium

USER CASE STUDIES:

Jeff Keltner
Enterprise Specialist, Google Communication Products, Google Inc.

Ann Huffty
Vice President of Implementation, ADP

Suzanne Zoumaras
Head of Worldwide Human Resources, Biosite, Inc.

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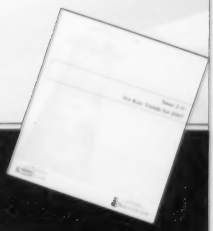

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Conference at a Glance

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TUESDAY APRIL 17, 2007

8:15 - 9:00
KEYNOTE: The Future of On-Demand
Jim Steele - President Worldwide Sales & Operations, Salesforce.com

9:00 - 9:45
KEYNOTE: Security as a Service
Art Wong - Senior Vice President, Symantec

10:15 - 11:00
KEYNOTE: Evaluating the SaaS Infrastructure
Treb Ryan - CEO, Opsource
Rich Kennelly - VP, Akamai
Moderated by: **Jeff Kaplan** - Managing Director, THINKstrategies

11:00 - 11:45

Focus Topic Areas:
SaaS on the Desktop
Paul Valcheff - VP of Business Development, Appstream
Brett Caine - Citrix

SaaS 2.0 Revisited - The Shift Toward Business Services
Bill McNee - Founder & CEO, Saugatuck Technology

How SaaS has made the IT Stack 3-Dimensional
Chris Hoffman - Senior Principal & Research Director, TripleTree

1:45 - 2:30

Focus Topic Areas:
Application Streaming & Virtualization: The New SaaS in the Enterprise
Chuck Brown - Intel

Understanding the Pay-as-you-go Model: How Should SaaS Vendors Charge for their Service?
Conor Halpin - CEO, LeCayla; **Camilla Dahlen** - President, Highdeal;
Ed Sullivan - CEO, Aria Systems; **Ken Boasso** - VP of Sales & Marketing (founder), Keychain Logic; Moderated by: **Amy Wohl** - President, Wohl Associates

Accelerating SaaS Infrastructure - A Customer Case Study: Akamai

2:30 - 3:15

Focus Topic Areas:
Business Intelligence as SaaS
Steve Lucas- Vice President of On Demand Software & Services, Business Objects

Human Capital Management: A Biosite Case Study
Suzanne Zoumaras - Biosite

Tapping into Open Source for SaaS
John Roberts - Co-founder & CEO, SugarCRM **Bill Soward** - CEO, Adaptive Planning
Barry Klawans - CTO, JasperSoft **Joaquin Ruiz** - VP of Marketing & Product Management, SpikeSource

3:30 - 4:15

Focus Topic Areas:
Magma Design Automation Expert Case Study: Connecting Salesforce.com with SAP in Just Days
Simon Peel - SVP of Integration Strategies, Cast Iron Systems **Chip Vanek** - Director of Corporate and CRM Applications, Magma Design Automation

SaaS HR Offerings: Best of Breed or Integrated Suite?
Michael Grefoire - CEO, Taleo

SaaS and the Evolution of Developer Programs
Oren Michels - CEO, Mashery

On Demand is In Demand

Tuesday April 17th Continued

4:15 - 5:00
KEYNOTE: SaaS - Enabling the Year of the Consumer
Greg Gianforte - CEO, RightNow

5:00 - 5:30
KEYNOTE: Changing the Game - What Video Games can Teach us About Solving for User Adoption **Paul Johnston** - President & CEO, Entellium

WEDNESDAY APRIL 18, 2007

8:30AM - 9:15
KEYNOTE: Introduction by: **Aneel Bhusri** - Co-founder, Workday
Dave Duffield - CEO and Co-founder of Workday
Interviewer: **Bill McNee** - Founder & CEO, Saugatuck Technology

9:15 - 10:00
KEYNOTE: Platforms and Ecosystems
Don Best - VP Strategy, Jamcracker; **Sinclair Schuller** - CEO, Apprenda; **Renee Bonvanie** - Senior Vice-President and General Manager, AppExchange and Developer Relations, Salesforce.com
Moderated by: **Phil Wainewright** - Director, ProculluxVentures

10:00 - 10:40
KEYNOTE: Jeffrey Nick - EVP & CTO, EMC Corporation

11:00 - 11:45

Focus Topic Areas:

OVERCOMING THE INTEGRATION HURDLE: PERVASIVE CUSTOMER CASE STUDY
David Inbar - Pervasive

SALES PERFORMANCE MANAGEMENT
Christopher Cabrera - CEO, Xactly Corporation; **Michael Torto** - CEO, Centive

ANATOMY OF A SAAS APPLICATION
Gianpaolo Carraro - Director of SaaS Architecture, Microsoft

11:45 - 12:30PM

Focus Topic Areas:

INTEGRATED SECURITY: KEEPING PACE WITH SHIFTS TOWARDS COLLABORATIVE COMPUTING
Jeff Keltner - Google; **Dick Hardt** - CEO, Sxip Identity

THE INGREDIENTS OF SAAS COLLABORATION
Linea Rowe - Director of eRoom, EMC; **Sridhar Vembu** - CEO, AdventNet/Zoho

IT MANAGEMENT WITH SAAS
James Maiocco - CEO, Klir Technologies

2:30 - 3:15

Focus Topic Areas:

FEDERATING SAAS APPLICATIONS
Andre Durand - CEO, Ping Identity

SAAS PPM: BENEFITS FROM AN END-USER PERSPECTIVE
Jeffrey Falk - Director of Product Development, The Members Group;
Ann Huffty - Vice President of Implementation, ADP;
Gerry Skipwith - Vice President of Services, Compugen

CROSS ENTERPRISE DATA INTEGRATION AS A SERVICE
John Hegstrom - Product Manager of on Demand, Informatica

3:15 - 4:15
KEYNOTE: Understanding the Intersection of SaaS and SOA, Web 2.0, Enterprise 2.0 and Office 2.0
Dave Mitchell - IBM; **Rajen Sheth** - Enterprise Product Manager, Google;
Brett Caine - CEO, Citrix Online. Moderated by: **Amy Wohl** - President, Wohl Associates

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meet with him and ask whether there is something different *you* should do. If you've already had that discussion and didn't agree with or understand his comments, it's time to meet with human resources. But if you don't take action, you'll remain a PITA, and eventually you will be fired.

The co-worker PITA: When a co-worker affects your performance, you could request a new assignment. But first, think about how much of your pain is caused by style. Does the PITA work differently than you? Perhaps he talks all the time, or not at all. Try structuring your encounters to fit his style and see whether that decreases your pain. The more people you can work with, the higher your value will be within your company.

Sometimes, though, you'll encounter a super-PITA — someone who succeeds only by creating problems for everyone else. You know someone has gained super-PITA status when your supervisor stops your complaints to tell you stories that are worse than anything you've experienced. Eventually, the super-PITA will cause pain for a senior executive and be fired. In the meantime, you'll need patience and support from your supervisor to survive.

Fortunately, super-PITAs are rare. Most of my PITAs have been small, causing pain that didn't extend past me. A few have had to be fired. But once I improved my processes, the ones who remained ceased being PITAs. In reducing my pain, their pain was reduced too, and many a PITA ended up among my best customers. ▸

BEN ROTHKE

The IEDs of Corporate Networks

READING ABOUT improvised explosive devices (IED) in *Military & Aerospace Electronics* got me thinking about information security. According to Annie Turner's article, although the U.S. is spending hundreds of billions of dollars on the Iraq war, it is losing soldiers left and right to IEDs that cost a few bucks.

IEDs are typically detonated by simple electronic devices like cell phones or garage door openers. They can be jammed, but locating those low-power signals among a lot of noise is difficult — and they usually aren't found before it's too late.

How do IEDs relate to information security? Companies spend billions of dollars on secure hardware and software to protect their networks from sophisticated hackers who try to break in with state-of-the-art tools. But those efforts have no effect on the IED of the corporate world: the trusted insider. If your network is breached by a typical hacker, the effects will likely be a basic port-scanning exercise or a denial-of-service attack.

BEN ROTHKE, CISSP, is a senior security consultant at International Network Services and the author of *Computer Security: 20 Things Every Employee Should Know* (McGraw-Hill, 2006). You can contact him at **ben.rothke@ins.com.**

But insiders have no need to bypass the physical and digital perimeter controls you have in place, and they have enough knowledge of the corporate and network topology to gain quick access to terabytes of corporate data.

What can you do to mitigate the risks of insider threats? The following five steps are a start. They must be executed within the framework of a formal program to deal with risk and the insider threat.

■ **Get real about the danger.** Most managers deride the very idea that their insiders would do malicious things on their networks. Of course, those same managers padlock supply closets to protect precious stocks of pencils, paper and printer toner. So why don't they lock the digital closets as well?

A great place to get a realistic understanding of the scope of the threat posed by insiders is at the CERT Insider Threat Research page (*www.cert.org/insider_threat*), which offers a lot of valuable information on the subject.

Naturally, you can't forget that insiders are the people who keep your organization going. The vast majority of insiders are loyal and trustworthy. Unfortunately, all it takes is one bad apple to do a lot of damage. Controlling those bad apples is what this is all about.

■ **Know your network.** Far too many organizations have no idea what their networks look like or even what assets are on them. In such a climate, insiders can carry out attacks using network paths that management knows nothing about.

If you don't know where your network starts or stops, then you can't protect it.

■ **Perform periodic enterprisewide risk assessments.** They'll ensure that you are worrying about the right things.

■ **Monitor.** Do you know what your users are doing on the network? Do you know which users have had what kinds of disciplinary problems? Talk to HR.

■ **Control.** All operating systems have significant levels of access control capabilities. But if those controls are not activated, then users will walk all over the network. You paid for the software, and it is imperative to use these and other controls to restrict access and accounts.

Insider abuse of digital assets is a reality. Denying it is like denying gravity. Organizations must understand the threats and have a plan to deal with them. If they don't, their corporate data will be pilfered by insiders. ▸

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READERS' LETTERS

Survey Wrong on Offshoring's Effects

THAT SURVEY is bunk ["Survey: Offshoring Does Not Cost Developer Jobs," *Computerworld.com*, Jan. 16]. Offshoring holds down compensation for *all* IT workers. It may be true that almost none of the companies surveyed had displaced any developers, but nonetheless, the use of offshoring means demand for workers has cooled in the U.S., thus lowering wages. It makes it less likely that U.S. students will be attracted to IT and more likely that IT workers will become disillusioned and find a different career.

John R. Carter
Antioch, Ill., jcarter@cap.org

More Visas, Fewer Jobs Is Bad Policy

WE HAVE a problem with dropping enrollment in technical studies because there are no jobs for graduates. In addition, many professionals have left IT because of a lack of jobs. To solve this problem, we want to bring in foreigners to take the limited number of jobs available rather than encourage our students to enter these fields ["Bush Wants H-1B Visa Cap Hike," *Computerworld.com*, Jan. 25]. There's something wrong with this picture.

Linda H. Peterson, CDP, PMP
Ph.D. candidate in IT management, San Antonio

Readers' Peeves About OS X, Vista

I DO NOT understand *Computerworld*'s love-struck zeal for all things Mac ["Wait! Don't buy Windows Vista!" *Computerworld.com*, Jan. 25]. I am forced to use Mac OS X every day in my office, right along with Windows, and my choice for any task, hands down, is Windows. Even after five years of using it, I find OS X to be clunky. It forces the user into staid paths of uncreativity and, if the user wants to do anything really interesting, requires just as much in-depth understanding of the innards of the platform as any Windows platform. I don't like the Mac's simplistic metaphor, and I don't like its look and feel.

For anything routine, I return to my Windows box and sigh with pleasure at the ease of accomplishing things that cause headaches on OS X. And as for development, the Macintosh is light-years harder to develop for than any Windows box; I know, because I've been developing on both for the past five years.

John A.M. Darnell
Software developer, Walsworth Publishing Co., Brookfield, Mo., John.Darnell@Walsworth.com

I AGREE: Don't buy Vista, not now, not ever. After using IE7 for several months, both in technical beta and in the release version, I find that it stinks. Vista is designed and built much the same way. The interface is nonintuitive. I have learned new interfaces many times in my 35-plus years of computing, but IE7 and Vista are a step backward in the usability department. And Vista is more expensive than any previous release to boot. I'd rather learn Linux than suffer any more dumbing down by Microsoft and its apparent philosophy of "You want to customize? No way! Have it *our* way." If I can't have it my way, I don't want it at all.

Richard Wick
Sales manager/assistant IT manager, Rimrock Automotive Inc., Billings, Mont., cargod0l@hotmail.com

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STRATEGIES & TACTICS

Inside 02.26.07

Lose Unwanted Gigabytes Overnight! Data de-duplication technology eliminates redundant information. Analysts say this diet can shrink 20TB of data into 1TB of backup data. **PAGE 30**

Q&A: Marshall Van Alstyne **PAGE 33**

IT Mentor **PAGE 34**

Security Manager's Journal **PAGE 36**

Opinion: Robert L. Mitchell **PAGE 38**

Most companies **still lack policies** for virtual offices. Here are some ways to allay the **huge data risks** they pose.

HOME OFFICE LOCKDOWN

By Mary Brandel

TELECOMMUTERS ARE nothing new at TriNet Group Inc., a human resources outsourcer in San Leandro, Calif. In fact, a significant part of the company's workforce operates remotely, either out of their homes or in small satellite offices, all on laptop computers, according to Bob Dehnhardt, the company's network and information security manager.

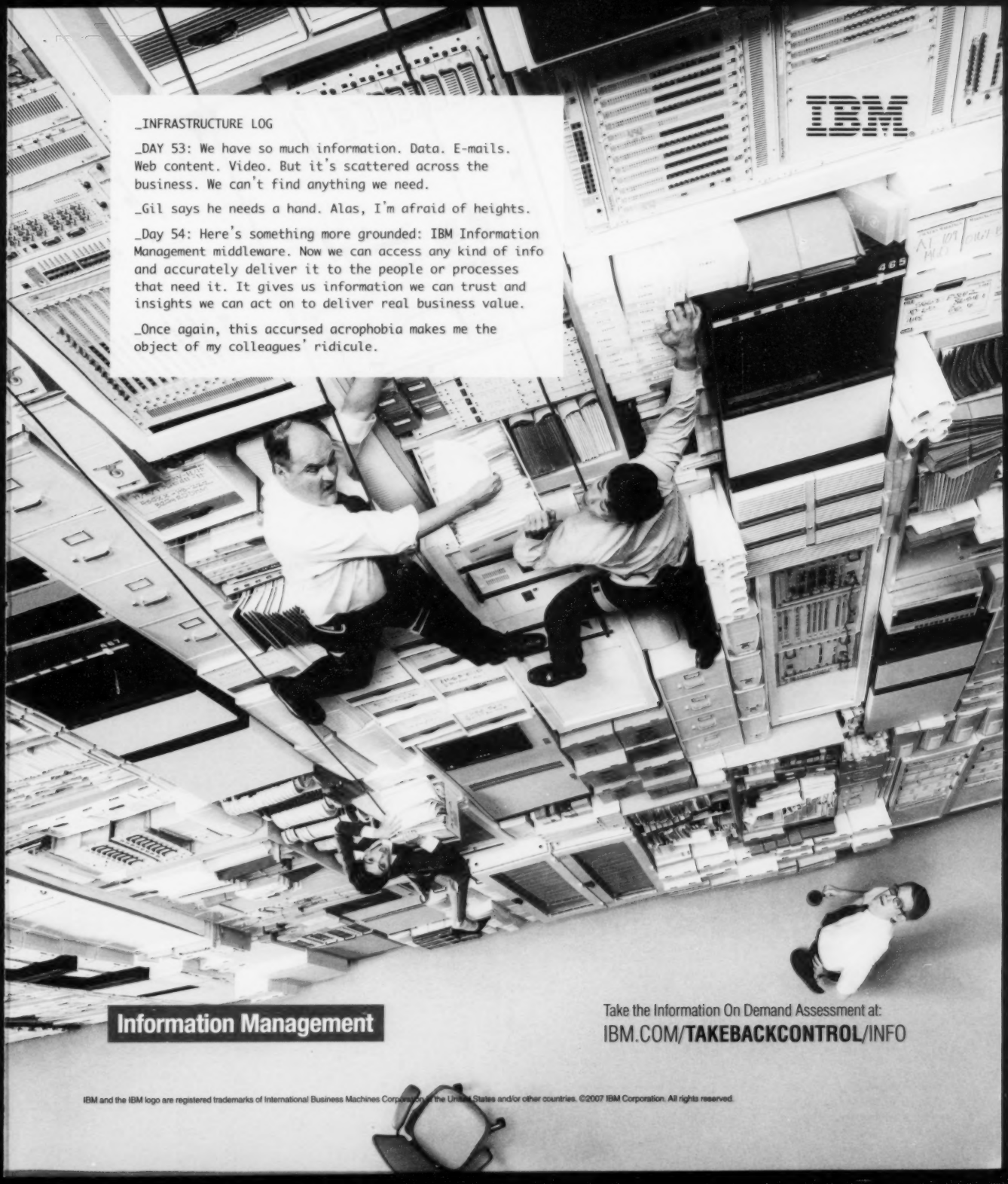
But over the past 18 months, Dehnhardt has grown increasingly concerned about the rising number of mobile computer security breaches in the news, most notably the theft of a laptop and external drive from a U.S. Department of Veterans Affairs employee — an incident that compromised the personal data of 26.5 million veterans and military personnel. So last year, he helped institute a series of security policies, including a requirement that all employees who work at home must sign a contract.

One of the contract's provisions states that such employees must be willing to open their homes for inspection.

"Working from home is a privilege, not a right," Dehnhardt says. "It has numerous advantages to both the employer and the employee, but it also constitutes a very real security risk for the company. There have to be rules and policies in place to protect the employer from this risk, and both parties must agree to them."

But TriNet is ahead of the curve in home-worker security. Despite network attacks, virus onslaughts, data loss and other hazards that remote users can introduce, many U.S. companies haven't bothered to establish security policies for teleworkers, according to Runzheimer International Ltd., a Rochester, Wis.-based provider of employee mobility products and services. In Runzheimer's 2006 survey of 87 organizations with mobile workers, 62% of respondents said they were concerned about the security of company assets located off-

Continued on page 28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Continued from page 26

premises, but only 46% reported that they have a virtual office policy.

"A lot of companies are just hoping that nothing will happen," says Jack Gold, a mobile technology consultant at Runzheimer. "And yet for a reasonable amount of effort, they could eliminate 90% of the potential problems."

For starters, telecommuters should use only company-owned equipment for their work, not their own home computers, Gold says. That way, IT can ensure that the equipment is loaded with virus protection software and other control devices. By keeping operating systems and application versions standardized, IT can also centrally manage virus updates. "If you rely on the end-user community to take care of their own systems, you're in trouble," Gold says.

At TriNet, telecommuters use centrally managed laptops. "This gives us a means of enforcing policy, since we own the equipment, and it also reduces the workload on our support people, since they don't have to troubleshoot why Billy's World of Warcraft installation broke our critical internally developed application," Dehnhardt says.

Another Method

The American Academy of Ophthalmology takes a different approach to managing security on home workers' computers. Until recently, the organization used only the security available in Microsoft Windows Active Directory and its virtual private network (VPN) software.

As viruses began disrupting bandwidth on the corporate network, however, Vice President of IT Joe Carr decided to take further measures. He installed Safe Access, an appliance from Superior, Colo.-based StillSecure that ensures that user devices have updated virus-protection software and appropriate firewall status before allowing them on the VPN. "We've had productivity in the office interrupted due to viruses, so we needed to make a change in the way people managed their equipment outside the office," Carr says.

Carr is also testing a policy in which Safe Access will check on the last time home workers performed virus scans on their machines. If more than a certain amount of time has passed, it will require a scan before allowing the device onto the VPN. "We test new policies with users to make sure the action is working before ratcheting it up academywide," he says.

Another TriNet policy forbids home workers from storing corporate data long term on their laptops, Dehnhardt says, although he doesn't know of any technology to help him enforce that. Instead, telecommuters are expected to access data through the company's VPN and store data on network home folders, which are backed up nightly. They're also discouraged from using USB or thumb drives because they can easily be lost or stolen.

TRAINING FOR VIRTUAL OFFICE EMPLOYEES

Percentage of organizations that offer their teleworkers the following types of training:

PC/network connectivity	72%
E-mail usage	67%
Business applications usage	67%
Safety and security of virtual office	39%

BASE: 87 organizations; multiple responses allowed

RUNZHEIMER INTERNATIONAL'S TOTAL EMPLOYEE MOBILITY BENCHMARKING REPORT, OCTOBER 2006

Of course, some data must reside on the laptop for times when the employee has no network access, like during customer visits. In such cases, remote workers are instructed to take only the data they need for that visit and delete it from the laptop immediately afterward, after saving any changes to the network drive, Dehnhardt says. "It's a fine line to walk," he acknowledges.

Mark Rhodes-Ousley, an information security architect and co-author of *Network Security: The Complete Reference* (McGraw Hill Osborne Media, 2003), agrees that data should mainly reside in centralized corporate repositories. "Home workers should be granted access to view and change data only from a distance," he says. That can be facilitated with systems that provide front-end access, such as Secure Sockets Layer VPNs.

Remote access makes the home computer a part of the company network, Rhodes-Ousley explains, whereas front-end access makes only the user interface accessible, separating users and their computing environments from the actual servers that manage the data. This technique presumes that users have a good broadband connection, Gold says, because dial-up could never handle the traffic load.

Everyone agrees that home workers should keep data encrypted, but relying on end users to do that is risky, says John Girard, an analyst at Gartner Inc. "Typical office applications have the ability to encrypt," he says, "but the choice is often voluntary, and the user can usually choose a simple, weak password and encryption algorithm."

That's why it's best to run the home PC as a virtual machine that's encrypted, where the user logs on to bring up an image of a company workstation, he says. Or home users could run an on-demand virtual session that encrypts saved data even if the workstation is otherwise not managed by the company, Girard says. This is possible with software such as Cisco Systems Inc.'s Secure Desktop, Symantec Corp.'s On-Demand Agent and Check Point Software Technologies Ltd.'s Integrity Clientless Security Secure Workspace.

At TriNet, all home laptops are encrypted using software from Beachhead Solutions Inc. in Santa Clara, Calif. The software provides centralized encryption management and remote data destruction if the laptop is lost or stolen.

Dehnhardt uses IPsec for encryption on TriNet's VPN, and he requires home wireless networks to be encrypted using Wi-Fi Protected Access when accessing the VPN. The only way to enforce this now, however, is through a signed statement and employee training, he says. "We don't have the [resources] to support home wireless equipment," he says. "It's better to educate the users to protect their home environment than to do it for them."

Dehnhardt also advises home workers to change their default service set identifier and administrator passwords on their wireless access points.

This year, TriNet managers will also periodically visit the homes of remote workers, in accordance with the company's policy for inspections of home offices for ergonomic, safety and security reasons. "If employees do not agree to this, their VPN access and laptops will be pulled, and they will not be allowed to work from home," Dehnhardt says.

This is an unusual policy among U.S. companies, according to the Runzheimer study. Only 13% of respondents said they conducted irregular or initial inspections as part of their virtual office policy. "There are some privacy concerns as to how frequently these inspections should take place and what advance notice is required," says Heidi Skatrud, a vice president at Runzheimer. "But companies absolutely have the authority to enforce security policy in people's homes."

Brandel is a Computerworld *contributing writer in Newton, Mass. Contact her at marybrandel@verizon.net.*

ON GUARD

Here are some tips from research firm Gartner for ensuring that home workers' wireless networks won't harm the corporate network or expose sensitive company information.

Turn off the service set identifier broadcast on all internal, nonpublic, nonguest access points. When this feature is off, the access point won't advertise its presence and will foil casual attempts to catalog access points.

Migrate to WPA2-compatible wireless LAN network interface cards (NIC), wireless drivers, supplicants and access points on all new purchases. Require the current best standard, WPA2, on all new WLAN equipment. Devices with non-Windows operating systems, especially smaller handheld devices, may need to use a third-party WPA2 supplicant.

Install a personal firewall in every laptop with a wireless NIC. Wi-Fi capabilities open up another attack path against laptops, particularly when they are used in public hot spots. The personal firewall built into Windows XP has minimal capabilities but is better than nothing.

Keep WLAN card drivers up to date. Vulnerabilities have already been discovered in some WLAN card network interface drivers that can cause exposure down to Layer 2 in the network stack.

Turn off peer-to-peer/ad hoc networking. All WLAN cards can link to other client systems without involving an access point, thereby losing all protection brought by strong authentication. Permanently disable this feature in registry settings.

Don't allow wireless and wired NICs to be active at the same time on a client system. When a client device is connected to a wired LAN, malicious software could use the wireless network for eavesdropping and network bridging.

– MARY BRANDEL

_INFRASTRUCTURE LOG
_DAY 34: This indecision is sinking the business. How do we move to a service oriented architecture? Where do we start? Can we reuse what we have?
_Infrastructure quicksand!! We waited too long. I'd throw Gil my tie, but it's a clip-on.
_DAY 37: A lifeline: IBM WebSphere middleware! It's already helped thousands of customers build an SOA. Adapters give us a standardized approach to integrating apps from SAP, Oracle and others. And it lets us reuse what we have, saving time and money.
_Oh, great. There's sand in my yogurt.
IBM.
WebSphere.
Download the reuse and connectivity kit at:
IBM.COM/TAKEBACKCONTROL/CONNECT

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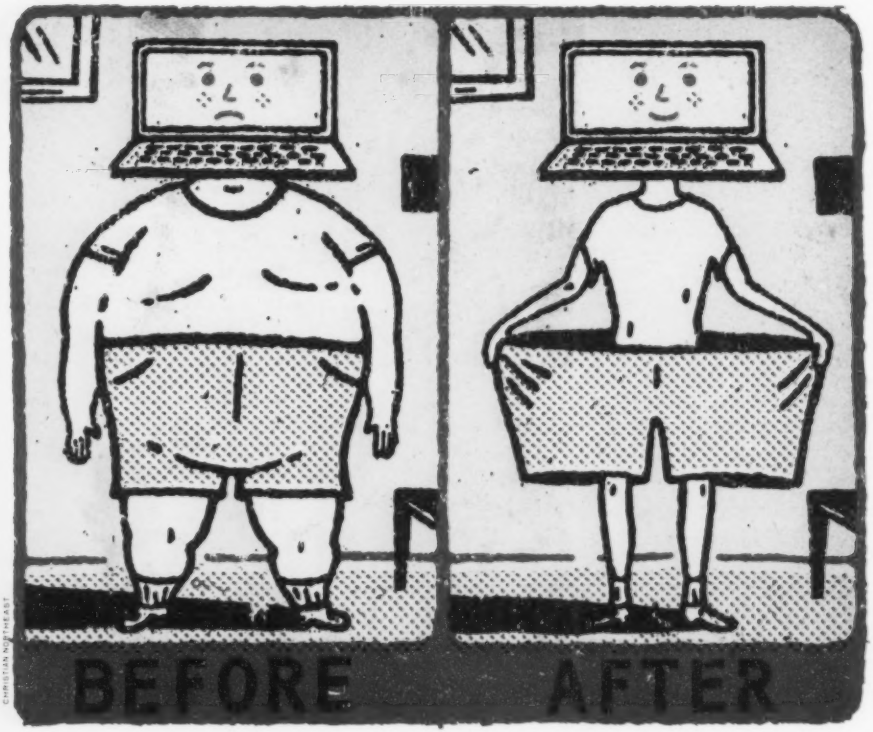

Data de-duplication technology eliminates redundant versions of the same information, yielding a **dramatic reduction** in backup data.

LOSE UNWANTED GIGABYTES OVERNIGHT!

By Jennifer McAdams

LIKE overstuffed closets, cluttered enterprise backup operations scream for attention. Fortunately, vendors are coming out with data de-duplication functions — packed into storage software suites or in standalone appliances — that sort through data destined for the archives and eliminate the redundancies.

Analysts say the technology can provide a 20-to-1 reduction of backup data. In other words, 20TB of original data can be shrunk to 1TB for backup purposes (see "Measuring Shrinkage," page 32).

Eliminating duplicate data seems like a no-brainer, but in the past, corporations were leery of losing data on its way to backup repositories. Only now are they getting comfortable with the reliability of de-duplication technology, which has matured thanks to advancements in data transfer techniques and standards. Specifically, the rise of Advanced Technology Attachment and Serial ATA technologies, along with huge spikes in processing power, have fostered better de-duplication functionality.

Suddenly, de-duplication is catching on big time, attracting big-name vendors such as EMC Corp. and Symantec Corp. In November, EMC acquired de-duplication vendor Avamar Technologies Inc., and now EMC is incorporating de-duplication into its Clariion, Centera and NetWorker product lines. Meanwhile, Symantec is reportedly scrambling to inject de-duplication capability into its Veritas NetBackup storage management software.

The premise behind de-duplication is as fundamental as it sounds. "Imagine having a Word document that was several megabytes in size. If you e-mailed that to a colleague who then added one word to that document, some [systems] would determine that this was a new document that needed to be backed up again," says Jason Paige, information systems manager at Integral Capital Partners, an investment firm in Menlo Park, Calif.

To make sure files such as Word documents with minor tweaks aren't stored several times over, ICP uses Avamar's de-duplication technology.

Corporate IT's comfort level with the technology has increased to the point

Continued on page 32

IBM.

_INFRASTRUCTURE LOG

_DAY 27: These compliance regulations are killing us! Audits. Inconsistencies. Processes. Time. Money. I feel like I'm being chased by regulators.

_Oh, wait. I am being chased by regulators. Run!!!!!

_DAY 28: I've got it: IBM Tivoli middleware. It automates system administration to standardize compliance policies. It centralizes processes to minimize the headaches of new and ever-changing regulations. And it helps pinpoint security issues before they become problems and maintains business integrity.

_Gil is bummed we had to ditch the high-carb diet.

Tivoli.

Better manage the business of I.T. at:
IBM.COM/**TAKEBACKCONTROL**/COMPLIANCE

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HASH IT OUT

Naturally, companies considering de-dupliction are wary of losing vital data that's falsely deemed duplicative. "When we looked for a de-duplication technology, we wanted to make sure that the de-duplication logic did not base its decisions on [bad] assumptions," says Oded Tagger, an IT manager in charge of business continuity and disaster recovery planning at the The First International Bank of Israel Ltd. Israel's fourth-largest bank, FIBI relies on de-duplication technology included in Diligent Technologies' virtual tape software, running on a dedicated Linux server that's "zoned" for disk storage. "This replaced our traditional tape library," Tagger says.

To make the most precise comparisons between potentially duplicative sets of data, de-duplication technology first breaks data into chunks through the use of hashing algorithms, usually MD-5 (Message Digest Algorithm 5).

A hash is a mathematical representation of a stream of data that MD-5 and other algorithms use to check for differences in data content.

On rare occasions, two chunks of data with differing content are assigned the same hash value. That is called a hash collision, and it could result in the destruction of data falsely identified as a duplicate. "Hash collisions would constitute a false positive and could happen. However, mathematically, a disk failure is much more likely than a hash collision," says Gartner analyst David Russell.

Some de-duplication vendors are moving to Secure Hash Algorithms (SHA-1 and SHA-2) – developed by the National Security Agency – in hopes of avoiding hash collisions, Russell says. "The choice of hashing algorithm," he adds, "is part of what constitutes a vendor's secret sauce."

– JENNIFER McADAMS

Continued from page 30

where some IT executives wonder whether de-duplication could extend from backup operations to disaster recovery and even primary storage. But first there are lingering questions about where best to insert de-duplication functionality in the backup process: at the client, at the disk or at the virtual tape library (VTL).

IT managers will have to ask vendors hard questions, because de-duplication methods vary significantly by vendor. "There is still a lot of confusion in the market about what data de-duplication is and isn't — and where it is best done. This confusion can delay adoption," says Heidi Biggar, an analyst at Enterprise Strategy Group Inc. in Milford, Mass.

But whatever confusion exists, corporate IT shops shouldn't be stumped for too long. "There are pros and cons to each approach, but all have potentially significant benefits for users by allowing them to reduce the amount of [storage] capacity they need on the back end," Biggar says. The benefits extend to other areas, too. For example, de-duplication can reduce the network bandwidth required for long-distance data replication, she says.

Where to De-dupe

Data de-duplication can take place either at the source or at the point where data is being written to disk systems or VTLs. "The packaging of this functionality can occur in three ways: as software, which can be stand-alone or integrated with the backup software; as a disk gateway or disk array; and, lastly, as a VTL," explains David Russell, an analyst at Gartner Inc.

Avamar and Toronto-based Asigra Inc. take the first route by performing de-duplication in backup and recovery software running on a protected server — before sending the data across the network to backup repositories.

Paige, an Avamar user, explains the process this way: "Scheduled jobs start at predetermined times of the day to 'snap up' the data. During this snap-up, the client software compares the data that is located on that client with the data that resides on the server — and only transfers the new or changed data to the server. This allows us to transfer large virtual data sets using very little bandwidth."

Some vendors take a second approach, relying on in-line, disk-based products that expunge duplicate data after it's shipped to a disk repository. Vendors using this method include Data Domain Inc., Diligent Technologies Corp. and ExaGrid Systems Inc.

Measuring Shrinkage

Storage vendors touting data de-duplication gains usually state their claims as ratios, comparing the amount of space it took to house multiple copies of the same data with the space required for de-duplicated data.

"We have found that it is not uncommon for these solutions to provide 20-to-1 reduction of backup data," explains Enterprise Strategy Group analyst Tony Asaro in a report on de-duplication. "For example, if customers can back up 20TB of data on 1TB of disk capacity, think about the implications of this. If a storage system costs $100 per GB, after de-duplication, it would cost $5 per GB."

Of course, de-duplication vendors aren't shy about making big promises. "I've heard claims that range from 20-to-1 all the way to 500-to-1. I think 20-to-1 or 50-to-1 is realistic," says Gartner analyst David Russell.

However, your mileage may vary. "The more duplicated data you have, the more opportunity you have to reduce that volume," says Russell, "and some enterprises could easily get to 100-to-1."

– JENNIFER McADAMS

Michael Bailess, network administrator at American National Bank and Trust Co. in Danville, Va., is an ExaGrid appliance customer. "Our [system] takes data from the staging area to the repository. Only those files with changes are then stored in the repository," Bailess says. The result is a "huge reduction in the amount of files we store," he says.

"The way ExaGrid handles data reduction meant that we were able to purchase a much smaller [storage] system than we would have with other types of products," Bailess says, adding that the ExaGrid product cost his company less than $20,000.

Data Domain, which uses an approach similar to ExaGrid's, says its appliance can spread the benefits of de-duplication to geographically dispersed sites. That was a key selling point for Troutman Sanders LLP, an Atlanta-based law firm.

"We have 15 offices but were able to quickly get de-duplication services down pat, since the device is shipped to the location and replication is done locally," says IT manager John Thomas.

The de-duplication investment really paid off, says Thomas. "We have been able to take 165TB of data and store 4TB. We are also able to produce instantaneous responses for users looking for archived data without having to deal with our tape-handling system," he says.

The third approach to data de-duplication is employed by vendors such as FalconStor Software Inc., Quantum Corp. and Sepaton Inc. These vendors offer data de-duplication as extensions of their VTL systems and perform the task outside of the backup process.

The systems in this category write all data to the VTL and then run a de-duplication process after the fact. This method ensures that de-duplication won't interfere with backup operations and has zero impact on backup windows and operations, the vendors claim.

The Trade-offs

It all sounds easy, but of course there are complications and trade-offs. For example, regardless of the chosen de-duping method, "performance degradation can be an issue," says Enterprise Strategy Group's Biggar.

Specifically, companies performing de-duplication at the source run the risk that this function will get in the way of the primary task at hand — protecting data as it is readied for offloading to backup storage systems. "The potential disadvantage here is that de-duplication can steal memory cycles from the backup servers," Gartner's Russell says.

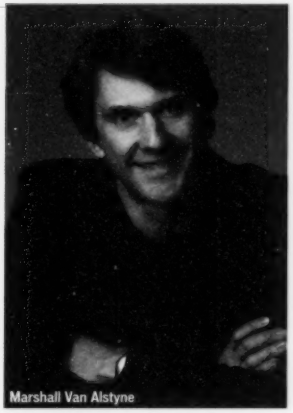
After-the-fact de-duplication poses challenges, too. More upfront capacity is required to store data that will be de-duped in postprocessing, says Biggar. "However, capacity is released after the de-duplication is complete," she notes.

But Biggar is quick to add that any trade-offs pale in comparison to the benefits of de-duplication. Her conclusion: "ESG Labs has tested several vendors' de-duplication technologies and has had no issue implementing or using the technologies, and we have substantiated vendors' data reduction claims. In general, the benefits of data de-duplication far outweigh any negatives." ▸

McAdams is a freelance writer in Vienna, Va. Contact her at JMTechWriter@aol.com.

How IT Makes Johnny More Productive

Tech-enabled multitasking leads to productivity gains at the desktop, a new study shows.



Marshall Van Alstyne

Q&A

In the past decade, studies have shown that IT leads to increased corporate productivity, but until recently, no one had measured how it affects work at the individual desktop level. **Marshall Van Alstyne** *and co-authors Sinan Aral and Erik Brynjolfsson recently completed a five-year study analyzing 1,300 projects and 125,000 e-mails to see how IT affects individual productivity. (The National Science Foundation, Cisco Systems Inc. and Intel Corp. sponsored their work.) In December, their research won the award for best paper at the International Conference on Information Systems, the largest academic IT conference in the world. Van Alstyne talked with Kathleen Melymuka about the authors' initial findings.*

What did your study cover? We looked at white-collar workers — executive recruiters. We wrote software to track e-mail communications over a year, and we tracked five years' worth of project activity. We chose extremely measurable output: dollars generated, contracts executed, start and stop dates of projects. These were highly representative of task-based work in sales accounting, consulting, law — all kinds of things. We interviewed and surveyed employees as well. It was voluntary, but better than 85% participated in the study. Then, at the individual and team levels, we ran analyses and figured out which variables are the best explainers of productivity.

What technologies did you look at? We asked employees how they were spending their time and where they were getting the greatest value: internal databases, external databases, other technologies, phone, face to face.

And you found a correlation between IT use and productivity? Absolutely yes, though not always as we had expected. If you look across e-mail and social networks, database and phone, the surprise was that overall, IT use is not associated with an increase in speed. In fact, it's associated with slower speed. But we found that heavier IT users are much heavier multitaskers, so over time, they're completing more projects and bringing in more money for the firm.

How does that work? Heavier IT users are taking on more work. This slows down the work they're already doing, but because they're doing so much more, they're more productive. So simply looking at speed, they might at first appear to be slower, but since they're multitaskers, they're more productive overall. The lower IT users are doing tasks serially, but high IT users are doing tasks in parallel.

Can you hit a wall while multitasking? The relationship between multitasking and productivity is an inverted U shape. Up to some point, productivity increases with multitasking, but past that point, multitasking detracts from productivity. Heavy IT users have more capacity for multitasking, so we'd say polish your IT skills but know your limits.

Which technologies support multitasking? The technologies that support multitasking best are asynchronous: e-mail and database work. You can use those when you have time as opposed to synchronous [technologies]. Face-to-face interviews was [considered] very powerful. Everyone wanted more of that, but it needs to be used selectively for project setup and takedown because it's so expensive. You need to use face to face to clarify ambiguity and communicate lots of information where subtle points need clarification.

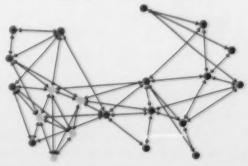
What else did you learn? Another surprise is that one of biggest predictors of productivity is social networks — the people you communicate with over e-mail. Social network analyses have indicators of where you are in the network — whether you're central or peripheral. If you measure the shortest communication path between each pair of individuals, the number of times anyone else appears in that path gives you "betweenness." That means they're in the thick of information flows, and it's a good predictor of their productivity. Another measure is reach. If you take the number of people you talk to and the number they talk to and take out the people who are the same, reach is the number of people you wind up reaching in one, two or three hops. The more you wind up having reached, the more diverse your information is. That affects the news you will have access to. In the next round of analyses, we'll analyze this.

What should businesses take away from this study? Invest in IT skills. High IT skill levels reduce the perception of information overload and facilitate multitasking, which is directly associated with increases in revenue. But don't necessarily expect high IT users to be faster in project completions. The real impact is that they're doing so much more. It's total projects completed, not time per project.

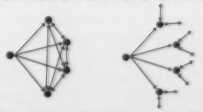
Also, there's evidence that the diversity of social networks really matters, not just the number of people. People have a tendency to build social networks by talking to people like themselves. That's fine, but it doesn't increase information diversity. You need to talk to people who aren't like you. That's not always easy, but it will increase the diversity of the information you have access to.

Betweenness And Reach

A person with a high degree of **betweenness** appears in the shortest communication path between many pairs of individuals. That person is in the thick of information flows and is likely to be highly productive.

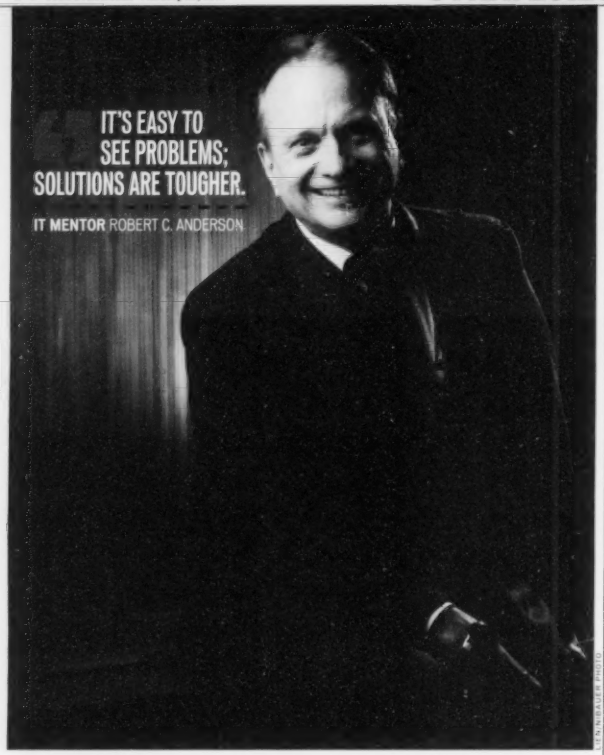


Reach measures the number of people you talk to and the number they talk to. If you all talk among yourselves, your reach is constrained. If you talk to people who talk to others who talk to others, your reach is unconstrained, and your information is more diverse.



Constrained vs. unconstrained

ILLUSTRATION COURTESY OF MARSHALL VAN ALSTYNE



25 Time-Tested Truths About IT Support

READ 'EM AND REAP BETTER PRODUCTIVITY, SERVICE AND OVERALL PERFORMANCE. BY ROBERT C. ANDERSON

WEBSTER'S DICTIONARY defines an axiom as "a self-evident truth that requires no proof." Over the course of decades in IT, I've discovered 25 axioms about the IT support environment. Being aware of these can help you design support processes that will make sense, work well and improve your team's performance.

IT MENTOR

Here are some of the great truths I've learned and how your team can apply them for better IT support:

1. The estimate a user hears is the estimate the user will remember; the date a user hears is the date the user will remember. Never give a verbal estimate or date you're not willing to live and die by.

2. Work without defined boundaries is work that may never end. Don't say, "I'm working on it," without qualifying when it will be done and, if necessary, why it won't be done on time.

3. The support team is most vulnerable when moving something into production. Just the right amount of constructive paranoia is a good thing. Are you *sure* the right modules and versions moved into production? Check again!

4. Users have selective amnesia. Always get sign-off or written approval.

5. Nothing will be done and nothing will work unless you invest some personal time to check it. Assume that, and you will never be surprised.

6. "No!" isn't a constructive response. Never use it when a request for work or assistance is made. Instead, say, "Let me review it, and I'll get back to you by Tuesday." Then think about it; you just might be able to help.

7. What you can't measure, you can't control. Define service-level goals, and capture measurement data at its source. Compare the "should" to the "is."

8. You can't come up with an accurate estimate without knowing the number and complexity of the functions required. Deconstruct functional requirements, even for small requests.

9. The fox is not a good henhouse guard. Don't quality-control your own work. Always have independent verification.

10. The test environment is not the production environment. Never assume that because it works in the former, it will work in the latter.

11. If you buy it, you own it. If you take the support call, it's your responsibility to make sure it's completed successfully.

12. Critique is positive; blame is negative. Don't blame; figure out how the group can do it better.

13. Murphy's Law is optimistic. Even the most carefully planned and executed activities will go astray at the worst possible moment. Always be vigilant, flexible and prepared.

14. Effective communication will smooth over a lot of problems or prevent potential problems from happening. Communicate potential problems or newly discovered issues to your colleagues and management team right away. Be proactive, not reactive.

15. Nobody likes surprises. Communicate changes to all who will be affected.

16. Your memory isn't trustworthy; neither is the user's. Don't trust memory; write it down.

17. Work isn't completed until you get verification from the user that it's completed. Never assume.

18. If you don't clearly define expectations, you will get what you deserve, not what you need. Be specific about what you want and when you want it, what you will deliver and when you will deliver it.

19. Users are customers, not problems. Treat them that way.

20. Perception is reality. Always get feedback on what you think you communicated. Never assume that your perception is their reality.

21. Accountability without authority leads to failure. If someone is being held accountable, give him the authority he needs to succeed.

22. It's easy to see problems; solutions are tougher. Never go to someone with a problem in one hand unless you have at least one solution in the other hand.

23. Your common sense is not always someone else's common sense. Don't assume that just because it's obvious to you, it will be obvious to others.

24. Technology doesn't always work as it's supposed to. Develop test strategies that thoroughly exercise the required operational limits of any technology on which the business depends.

25. Irretrievable data corruption usually occurs on files that are not backed up. Always back up your systems and data on a regular schedule.

If you design your IT support processes with these truths in mind and get your group to live by them, you'll improve your productivity, the quality of service delivered and overall performance. ▸

Anderson is director of process development at Computer Aid Inc. Contact him at Bob_Anderson@compaid.com.

A SUPPORT PROCESS FRAMEWORK

Best-practice support processes need to be well defined, repeatable and compliant with industry standards like CMM and ITIL. Designing and implementing them is hard work. But if you stick with it, the dividends in reduced operational costs as well as improved quality and customer satisfaction are well worth the effort. It has been my experience that where defined, repeatable processes and metrics are implemented, a savings of 30% to 50% in IT support costs is likely. In order to achieve these savings, processes must formally document the answers to the following questions:

- What type of work is being done?
- How can the same type of work be done with a high degree of repeatability?
- Who is doing the work? What are their specific roles? Who is responsible?
- What supporting documents or other deliverables are required as part of each task?
- How do we know that what was requested was delivered?
- How do we define quality in work products produced?
- How do we capture data on all work performed and the people who do that work?
- How do we measure performance, productivity, quality and customer satisfaction within all work processes, products or services?

These last questions are particularly crucial. Embedded within any good support process must be the ability to capture and report operational data that provides feedback on how the processes and resources are performing.

With questions like these as your framework and the 25 truths of IT support as guidelines, you'll avoid missteps as you build your support processes.

– ROBERT C. ANDERSON

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Getting the NAC Of Things at RSA

When you have a problem like access control, the RSA conference is a good place to look for an answer. By Mathias Thurman

SECURITY MANAGER'S JOURNAL

WHEN IT comes to conferences, there are two on my can't-miss list: the RSA conference and Black Hat. So I was happy to find myself last month in San Francisco (it's my favorite U.S. city) attending RSA Conference 2007.

RSA is the one place where I can bump into old colleagues, have chats with domain experts and find out what's coming from almost every major security vendor. The keynote speaker list is usually impressive — this year, it included former Secretary of State Colin Powell — and the sessions are quite informative. It seems as if each year, some theme or technology stands out, and for me this time, the technology was Network Admission Control.

NAC is of great interest to me because it can solve so many problems. A major issue for my company involves guest laptops. Whether it's a vendor providing a demo, a partner who is visiting one of our engineering groups, a consultant or a contractor, guests who plug laptops into our network pose a risk.

We could segment our conference rooms onto a separate virtual LAN, providing only limited access and no contact with the corporate LAN. But that wouldn't address what is frequently the reality: Visitors are placed in empty cubicles or congregate in labs, offices or other shared work spaces. A company like ours, with an entrepreneurial environment and an engineering-centric mission, can't place restrictions on who works where. It would be a nightmare to enforce a written policy, and we just don't have the staff to do it or the budget to properly segment our network. Enter NAC.

If done properly, NAC would let us apply restrictions at the switch level. We could control how any device that gets attached to our network relates to the network. Guest laptops could be required to have certain patches, antivirus software and a good desktop firewall policy before they could gain any access at all. If the laptop failed to meet those requirements, it would be placed on a "fix-up" or quarantine network until it "gets right" by having software installed or being properly configured.

NAC could also eliminate problems with rogue wireless access points. We've had unauthorized APs attached to unused ports both here in the U.S. and at our overseas sites. During my last trip to Seoul, South Korea, I noted that several unauthorized wireless APs were attached to the company network.

The users, who were finance folks, didn't understand the security implications. They just wanted to be on the network when they were in a conference room that didn't have any network access. (Ironically, that same office had an authorized wireless deployment; the finance folks didn't know about it because the service set identifier isn't broadcast and their laptops weren't configured properly.) With NAC, an unauthorized AP would be rendered useless.

> I imagine that ID management, coupled with NAC, would be nirvana to any security professional.

Usually what happens with NAC is that the switch port won't recognize a rogue device like a wireless AP as being authorized. But some NAC approaches don't rely on this device awareness in the switch.

For example, Microsoft's approach is to issue a Dynamic Host Configuration Protocol address to compliant devices. Devices with a legitimate DHCP address get access to the corporate critical infrastructure, while others are given a DHCP address that maps to a quarantine network. Cisco's method, called Clean Access, forces all users to a single virtual LAN until they are authenticated or pass the proper security requirements.

ID, Please

Another popular technology at this year's conference was identity management. I imagine that ID management, coupled with NAC, would be nirvana to any security professional. ID management tackles the other half of the restriction puzzle: How do you manage access to a wide variety of applications?

At the heart of ID management is a directory server, where every employee is identified and granted or denied access to corporate applications. A Unix administrator, for example, would be granted access to various Unix administrative tools and portals, but not to financial applications. The opposite would be true for a financial analyst, and very few applications would be available to someone working in the mail room.

ID management isn't new, but sometimes I think it will meet the same fate as public-key infrastructure, meaning that despite the hype, no one will spend the money to implement the technology. All the same, A10 Networks, Ping Identity and CA all had impressive stories to tell regarding their ID management tools.

I'm always asked after a conference which technology on display I thought was cool. This year I stopped by the booth of Mandiant, a company that years ago helped me with a security breach. It's renowned for its forensics expertise and computer security training programs, and this year it was touting a new product that allows multiple analysts to remotely access and analyze a system.

The analysts might be scattered around the world, but they can still collaborate on analyzing your system. And you don't have to pack up the system and ship it off to the analysts, which is a real plus when you suspect that an employee might be up to something illegal on company resources. Of course, Mandiant's technology requires software to be installed on the compromised machine, but nowadays, that's a fairly trivial task. I'll definitely be spending more time evaluating this service.

But RSA and San Francisco are behind me for now. I'm back in my office, managing a huge third-party risk assessment. I'll discuss that in my next installment.

WHAT DO YOU THINK?

This week's journal is written by a real security manager, "Mathias Thurman," whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com, or join the discussions in our security blogs: **computerworld.com/blogs/security**

To find a complete archive of our Security Manager's Journals, go online to **computerworld.com/secjournal.**

SECURITY LOG

AirMagnet Offers Cisco Analyzer

AirMagnet Inc. has released Enterprise Analyzer for Cisco, a new feature in Enterprise Analyzer 3.0 that collects data from Cisco wireless access points for analysis and reporting. The software, which includes performance optimization tools, starts at $9,995 for three controllers and a single company license.

Sun Launches Identity Services

Sun Microsystems Inc. has launched its Identity Management Professional Services. Included in the vendor's offerings are a human resources synchronization service, role management service and password management service. All of the offerings are built around Sun's Velocity Identity Deployment Tool.

Free Password Manager Debuts

Actioneer Inc. has released a free password management program for Windows computers. The company is also offering a version that is designed to reside on a USB thumb drive and is free for personal use. Both products use Triple DES encryption and automate logging into Web-based accounts.

KeepYouSafe.com Announces Beta

KeepYouSafe.com announced a beta program for a service that allows users to encrypt and share sensitive files. Files are uploaded from a browser using SSL encryption and stored on KeepYouSafe.com's servers using AES encryption. The service then sends the recipient an e-mail and "claim code" to access the file. The service is free during the beta period.

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What is the greatest benefit of the SaaS offering?

Greater ROI and cost-effectiveness 40%

Improved application reliability and performance 21%

Lower staff support requirements 19%

Systematic updates and upgrades 12%

Other 8%

SOURCE: CUTTER CONSORTIUM WEB SURVEY, OCTOBER/NOVEMBER 2006

Base: 128 respondents (88 IT professionals in end-user organizations; remainder representatives of IT and software vendors, independent consultants and channel organizations)

ROBERT L. MITCHELL

The Liquid Data Center

LIQUID COOLING is coming to your data center. It's not a matter of whether you want it or not. A migration from air to direct liquid cooling is simply the only option that can address surging data center energy costs and allow the power densities of servers to continue to increase into the next decade. It will be too expensive not to adopt it. And it's coming sooner than you might think.

If it were up to engineers, direct liquid cooling would have been here five years ago, says 25-year IBM veteran Roger R. Schmidt, a distinguished engineer with experience designing water-cooled mainframes. He expects distributed systems to follow in the mainframe's footsteps.

Some data center managers may not fully grasp the problem, because over the past eight years, server performance has increased by a factor of 75 while performance per watt of power has increased 16 times, according to Hewlett-Packard Co. But data centers aren't using fewer processors — they're using more than ever. Meanwhile, the power density of equipment has increased to the point where power and cooling systems vendor Liebert Corp. is supporting clients with state-of-the-art server racks exceeding 30 kilowatts (kW).

That creates two problems. First, energy costs are spiraling upward. Many data center managers don't see that today, because their power use isn't metered separately and isn't part of the IT budget. As costs rise, that's likely to change, forcing IT to retrofit data centers to the new reality. Second, all that energy gets converted to heat. If you want to know what the heat coming off a 30 kW rack feels like, turn your broiler oven on full blast and open the door. That's 3.4 kW. Now imagine jamming nine broiler ovens, all running full tilt, into the confines of a single rack in your data center and trying to maintain the internal temperature at or below 75 degrees.

Dave Kelley, manager of environmental application engineering at Liebert, says current air-cooling technologies can perhaps handle racks in the "mid-30s." But equipment vendors say that 50 kW racks could be a reality within five years.

ROBERT L. MITCHELL is a *Computerworld* national correspondent. Contact him at **robert_mitchell@computerworld.com.**

Christian Belady, a distinguished engineer at HP, is passionate about educating data center managers about the problem and establishing standards for liquid-cooled data centers.

"If you look at the energy costs associated with not driving toward density and taking advantage of these densities, there will be huge penalties from an efficiency standpoint," Belady says.

But all that heat will have to be removed from the data center, which is one reason why data center infrastructure costs per server have risen. In fact, while the cost of server hardware has remained flat or declined slightly, Belady estimates that the cost of the data center infrastructure to support a server over a three-year life span exceeded the hardware cost back in 2003.

> **"This year, the cost of energy (power and cooling) required per server . . . has pulled even with the equipment cost. By 2008, it will surpass it, becoming the single largest component of server TCO.**

This year, the cost of energy (power and cooling) required per server, amortized over that same three years, has pulled even with the equipment cost. By 2008, it will surpass it, becoming the single largest component of server TCO.

That's where liquid cooling comes in. Direct cooling of servers by piping liquid refrigerant or chilled water directly to components within racks is far more efficient than using air and will become a requirement.

How soon? Kelley says his company has projects under way with IT equipment vendors that he can't discuss. But he predicts that "within a couple of years, somebody will have something where you can plug [a line containing liquid coolant] directly into a processor."

More efficient designs could substantially cut cooling costs, which today can account for more than half of data center energy use. Best practices and optimizations of existing infrastructure can bring immediate savings.

On racks approaching 30 kW, users are turning to spot-cooling systems that run liquid refrigerant or chilled water to a heat exchanger that blows cool air from directly above or adjacent to server racks. That's more efficient than room air-conditioning units because the chilled air travels a shorter distance. These designs pipe liquid coolant, already used by computer room air-conditioning units at the outer edges of the data center, up to the racks themselves. It's not hard to imagine extending those lines into the racks to deliver direct liquid cooling. The heat exchanger goes away, perhaps replaced in an IBM BladeCenter chassis with a hookup that accepts a chilled water or liquid refrigerant feed.

Today, spot-cooling systems typically require ad hoc copper piping overhead or under the floor to reach individual racks. As more and more racks require such cooling, data center managers face a potential mess. What's worse, since few standards exist, things as basic as liquid coolant specifications and pipe couplings remain proprietary.

Belady is pushing for common standards. "If we wait," he says, "everything is going to be much more proprietary, and when that happens, you lose the opportunity for interoperability."

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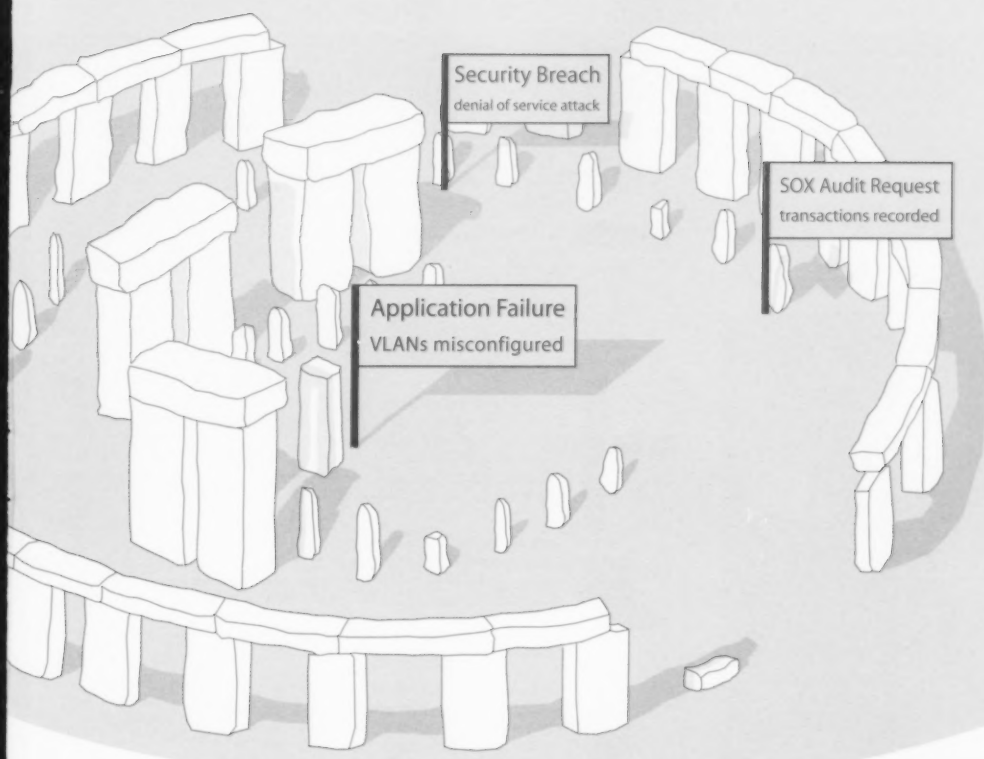

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Web 2.0

DIA meet the directives from the 9-11 Commission and other entities for intelligence agencies to "improve and deepen our collaborative work processes," he said.

The DIA launched its first wiki, dubbed Intellipedia, in 2004 on the Defense Department's Joint Worldwide Intelligence Communications System, a top-secret network that links all of the government's intelligence agencies.

"The collaboration potential of the social software side is really being thoroughly vetted and is now rapidly being adopted," Shepherd said. "Across agencies, wikis and blogs are becoming as ubiquitous as e-mail in terms of information sharing."

Although the agency's mission of providing intelligence to support military planning and weapons acquisition is often fodder for spy novels or Hollywood blockbusters, Shepherd said the DIA's analysts are similar to workers in other industries in that "they rely upon and demand instant gratification" for their information needs.

"One of the virtues of a wiki format is that there is a blurred line between authoring and dissemination," he added. "The second something is authored, someone else can edit it [and others can] comment upon those edits."

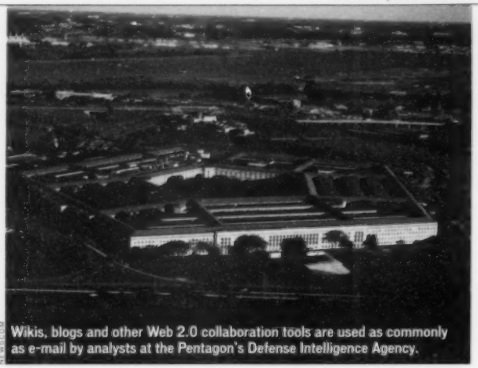
The agency is also escalating its use of Asynchronous JavaScript and XML, better known as AJAX. The programming method uses JavaScript within the client to build applications that are more interactive than pages built with HTML and that don't need to refresh a Web page every time a user enters or receives new data.

Last year, the DIA began a project to create a data access layer using a service-oriented architecture to pull together human intelligence (data gathered by people) and publicly available data gathered from the Internet and other sources into a single environment for analysis, Shepherd added.

'Top-Secret Mashups'

Analysis of data in this new environment will be done in part using Web 2.0 applications, such as "mashups," which collect data sources such as RSS feeds, Internet maps and information from the DIA network, Shepherd said. Users can access those mashups with a lightweight AJAX front end, he added.

"Web 2.0 mashup fans on the Internet would be very much at home in the burgeoning environment of top-secret mashups, which use in some cases Google Earth and in some cases other geospatial, temporal or other display characteristics and top-secret data," Shepherd said.



NEWSCOM

Wikis, blogs and other Web 2.0 collaboration tools are used as commonly as e-mail by analysts at the Pentagon's Defense Intelligence Agency.

Although he did not provide additional details on how the agency is using mashups, Shepherd did note that the DIA is using JackBe Corp.'s AJAX tools as part of the effort to build this new type of application. JackBe has said publicly that the DIA is using its NQ Suite of AJAX tools to build a desktoplike dashboard that can display intelligence data from a variety of sources through a standard browser.

Prabhat Agarwal, an information security industry analyst at Input, a research firm that specializes in governmental issues, said that the DIA and other defense agencies have become the most advanced users of Web 2.0 tools in the federal government because they have a more secure IT infrastructure. ▸

Feinstein Calls for Probe Into E-voting Machines

Senator asks GAO to look at potential for DRE malfunctions, election fraud

BY MARC L. SONGINI

An influential U.S. senator has called on the federal government to find out why electronic voting machines have caused problems in some recent elections.

Sen. Dianne Feinstein (D-Calif.) earlier this month asked the U.S. Government Accountability Office to conduct an investigation of e-voting machines — especially those systems that fail to produce paper receipts for the ballots cast.

Feinstein, who chairs the Senate Rules and Administration Committee, called on the GAO to complete its investigation before the 2008 presidential election.

The senator also asked the GAO to investigate claims by some e-voting critics that certain machines are prone to error, can be easily hacked and altered, and can be secretly reprogrammed to change the outcome of a race.

A GAO spokesman last week said that the agency has begun reviewing Feinstein's request and is concerned that the proposed assessment would require a very broad investigation into e-voting technologies. Agency officials hope to meet with Feinstein to discuss her request, but no meeting had been scheduled as of last week, he said.

'Top-to-Bottom' Review

In the Feb. 14 letter to the agency, Feinstein asked that GAO Comptroller General David Walker review several specific models of direct recording electronic, or DRE, voting machines, including the AccuVote TSX from Diebold Election Systems and the AVC Edge System from Sequoia Voting Systems Inc.

She requested that the GAO determine whether those machines exhibited irregularities or were subject to fraud, software bugs or malicious code insertion in the past two federal elections.

Feinstein specifically asked that the GAO conduct a "top-to-bottom" review of the iVotronic touch-screen systems used in the controversial 13th Congressional District race in Sarasota County, Fla., last year. In that election, 18,000 ballots didn't record a vote in a race where Democrat Christine Jennings was beaten by Republican rival Vern Buchanan by a mere 369 votes.

Jennings has filed a lawsuit alleging that voting machine malfunctions caused the undervote and threw the race to Buchanan.

The iVotronic machines are manufactured by Election Systems & Software Inc.

Feinstein has also asked the GAO to review the printers used to create paper receipts of the ballots cast on the DREs. She noted that paper jams and printer malfunctions in a 2004 election in Cuyahoga County, Ohio, caused 10% of the paper voting records to be ruined.

She urged the GAO to complete the study as soon possible and report back to the Rules and Administration Committee. "With the 2008 presidential election fast approaching, time is of the essence," she wrote in the letter.

A spokesman for Feinstein estimated that it would take a number of months for the investigation to be completed.

He noted that Feinstein had singled out the Sarasota incident as a "clear example of what can go wrong, and she wants to find out the reasons and prevent it from happening again." ▸

With the 2008 presidential election fast approaching, time is of the essence.

SEN. DIANNE FEINSTEIN, IN A LETTER ASKING THE GAO TO UNDERTAKE AN INVESTIGATION OF E-VOTING EQUIPMENT AS SOON AS POSSIBLE

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FRANK HAYES ■ FRANKLY SPEAKING

Hard Data

NO THEORY is ever as good as lots of real-world data. So here, based on lots of real-world data, is what you should do to minimize problems with hard disk drives: a) burn them in rigorously; b) replace them as soon as they start throwing errors, especially scan errors; and c) retire them before they turn three years old. Oh, and d) remember that none of those measures is a substitute for regular backups.

That's the gist of a pair of amazing studies presented at the FAST '07 storage conference this month. Two separate research groups each collected data on 100,000 disk drives, some of which failed — then they crunched the numbers to identify how the drives failed, what they (mainly) failed from and what they (mostly) *didn't* fail from.

And ho boy, do they ever fail. Hard drives are the most commonly replaced hardware item in many data centers, and they account for 16% of all hardware-related outages. Anything that tells us how to keep them from dropping dead is money in the bank for IT shops.

One of the studies, from Carnegie Mellon University, got its statistics from a wide range of sites, including the Los Alamos National Laboratory, the Pittsburgh Supercomputing Center and various Internet service providers. (You can find that study online at *www.usenix.org/events/fast07/tech/schroeder.html*.)

The other study sifted through data from Google's automated system for tracking performance of drives in its own huge storage farms. That one's at *http://labs.google.com/papers/disk_failures.pdf*.

If those two populations sound very much alike — well, listen harder. High-performance computing centers tend to buy gear with high-performance specs. Google, on the other hand, is notoriously cheap when it comes to hardware — it buys garden-variety hard drives in large lots from whoever is offering the best deal that particular week.

But it turns out that high-end and consumer drives have a lot in common. For one thing, they typically don't last the five years that drive vendors say they should, at least not in server-farm settings. Drive failures at Google take a big jump once drives get to be more than two years old. And according to the Carnegie Mellon team, those rising failure rates never level off — they just keep going up as drives get older.

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at **frank_hayes@computerworld.com**.

Think using a drive a lot will make it much more likely to fail? Nope, say the guys from Google. Low-utilization drives fail at almost exactly the same rate as high-utilization drives.

Think RAID is a guarantee against a storage catastrophe? Don't believe it, say the Carnegie Mellon folks. According to their real-world data, in RAID 5 arrays, when one drive fails, another drive failure will often happen much sooner than it theoretically should — maybe even before you've replaced the bad drive and rebuilt the data set on the RAID array.

Think overheating drives are a major source of failure? Only when they get really, *really* hot, say the Googlers — and even then, it's mainly a problem for drives that are three years old.

And while the Carnegie Mellon study found that SCSI, Fibre Channel and Serial ATA drives all fail at about the same rate, the Google study determined that some brands and models actually *are* much better when it comes to drive survival. Which are the best hard drives to buy? The Google guys aren't saying, the creeps.

But aside from that, these studies are a real gift to data centers.

Until now, all we've had to go on was vendor specsmanship, anecdotal experience and small-scale research. We had our rules of thumb and our theories — and that was it.

Now we've got hard data to work from, lots of it. We know much more about how drives die, and how they don't. And now we can do something about it.

Burn 'em in. Watch for errors. Don't let 'em grow old.

And *test* those backups, OK?

Yes, You *Can* Be Too Careful

Office space is being remodeled, so all the PCs are being put into storage. "One user, very sensitive about his PC and new monitor, came to us and insisted that 'someone's PC is going to be stored on the bottom and someone's on top, and I want mine to be on top,'" reports a pilot fish there. "When we packed up the PCs, he had wrapped his PC and monitor all up in tape so it was one large package, and we dutifully placed it on top of all the others." And when the two-dozen PCs were reassembled three days later? "Everyone's PC was fine except our very particular user," fish says. "His prized monitor had come through with a cracked screen – the only incident in the move."

SHARK TANK

No Net?

Trouble ticket says a workstation is getting no signal and can't connect to the network. Network support pilot fish checks the net plans, and there's a wireless access point less than 20 feet away, so that can't be the problem. "Arriving in the room, I quickly confirm that the PC has a wired network connection, and the network socket tests out fine," says fish. "So I power up the PC – and 'No Signal' appears on the monitor. I remove the video cable from the disabled onboard port and connect it to the graphics card. Success. Strange, these network problems."

Beware the ;-)

User pilot fish sends a request to IT: "Would it be possible to get a flat-panel monitor like Jose has, and turned vertically? This fax software is killing my old eyes. I tried turning my monitor sideways, but it didn't quite cut it. ;-)" Not long after, concerned IT guy shows up at fish's desk. "I heard you put in a request for a flat-panel monitor," IT guy says. "Did you really try turning your big monitor sideways? We were concerned that it may have caused problems."

Aha!

Office manager asks pilot fish for help packing up a workstation that's being sent off for servicing. "Will you come undo this cable?" asks manager. "I can't get it loose." Turns out it's an old CRT monitor with a video cable that's hardwired. I can't remove it either, without pliers, fish says. Why are you trying to take the cable off the back of the monitor, anyway? "So I can take the computer to the service center so they can replace the hard drive." Um, says fish, why don't we just unplug it from the PC? "Ohhhhh. . . . "

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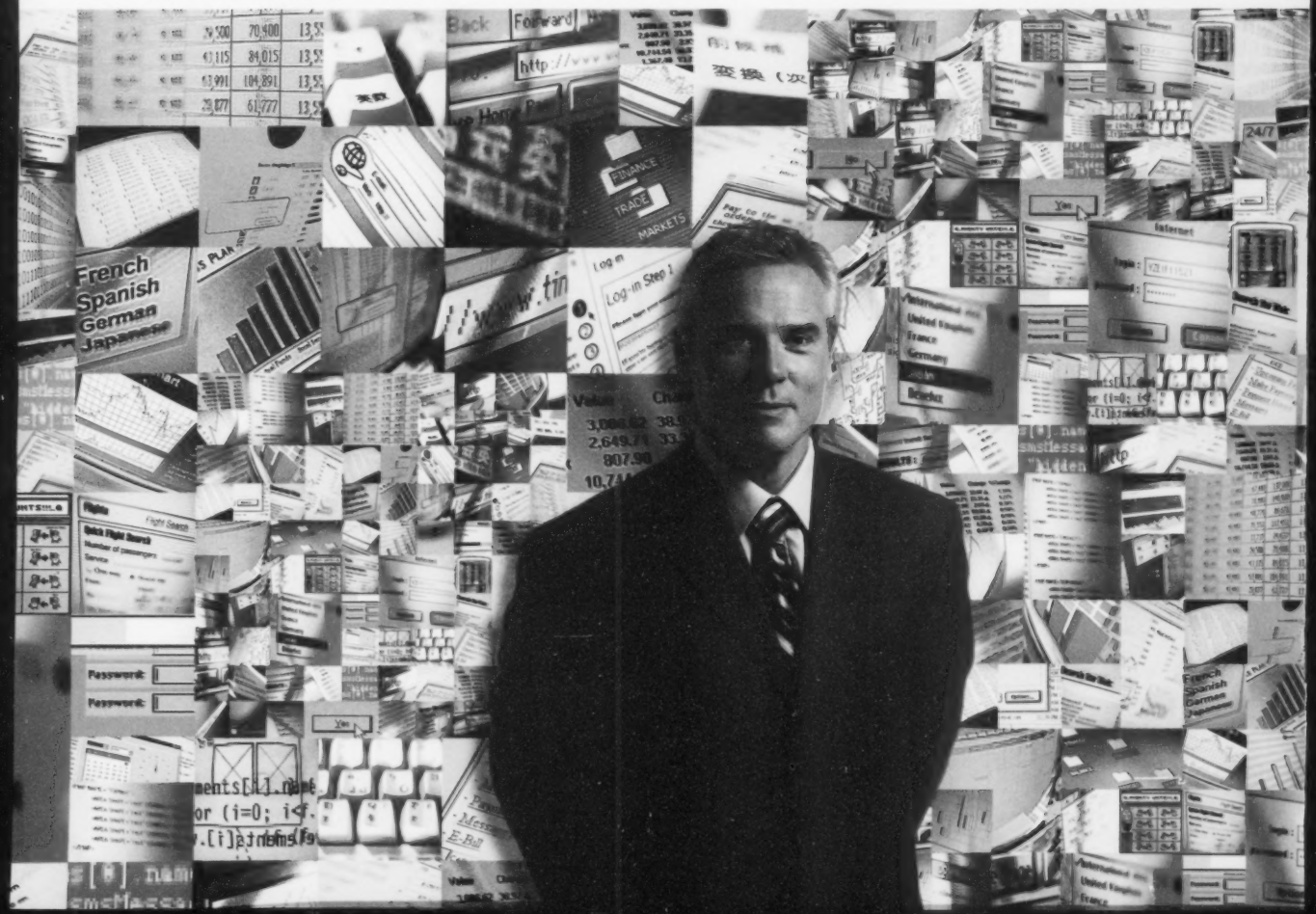
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